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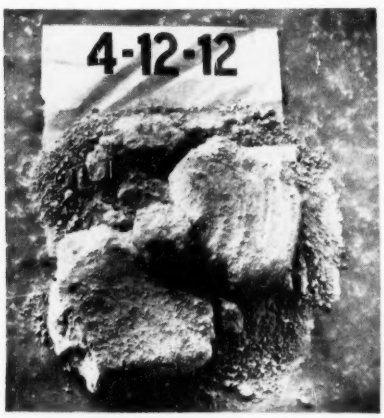

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These pictures show the effect of the addition of Tennessee's **SUL-FON-ATE AA 9** to one of our more troublesome formulas. The nitrogen was all solution. Both samples were cured for 4 days and then bagged. The bags were stacked for 10 days and the above samples were taken from the bottom bags.

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Since manufacturing processes vary widely in fertilizer plants, the best method of introduction into the mixer must be determined at each plant. Our plants prefer to distribute it on the conveyor belt feeding into the mixer. In the pictures shown **SUL-FON-ATE AA 9** was added to the potash. It is not necessary to make any changes in operating procedure.

For further Information, please contact

ORGANIC CHEMICALS DIVISION

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617-29 Grant Building, Atlanta, Georgia

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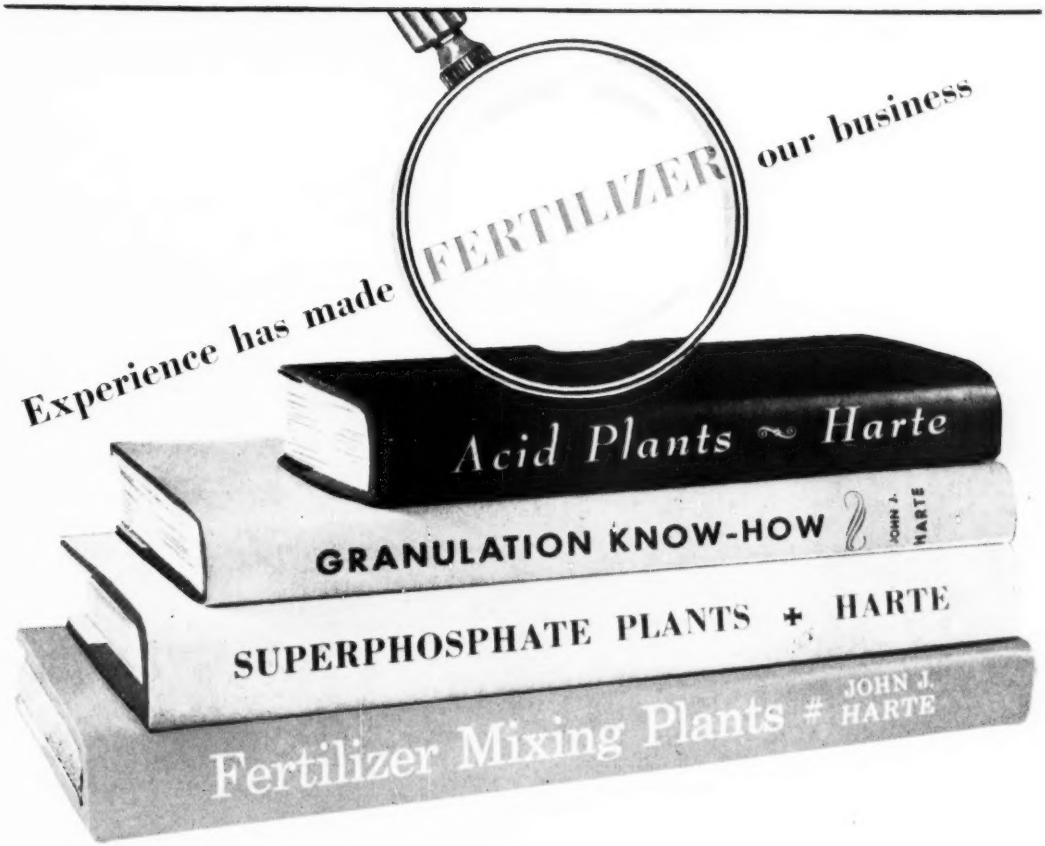

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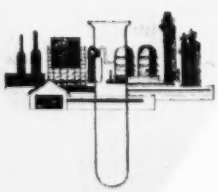

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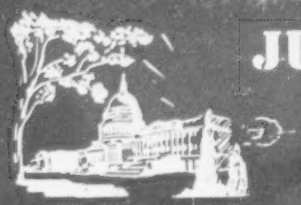

JUST AROUND THE CORNER

By Vernon Mount

THERE ARE THORNS on the road back to the freedom of Free Enterprise. All of us cheer for the idea, until our own little red wagon has to be greased with our own elbow-grease instead of Uncle Santa Claus'.

POLITICAL SCREAMS are, of course, louder than those of the farmers, for instance. Sober-minded farmers know that in the long run they'll be better off as free agents. But the marginal farmers will always want help. And even the most ardent advocates of Free Enterprise recognize that something must be done to keep 'em down on the farm.

THE FIFTH PLATE--the added 20% of population coming up soon, and needing to be fed--still stares us in the face. So, while Secretary Benson sounds tough about it, he is asking the farm groups to help make a plan that will keep farm products flowing at a profit, without the Government buying a million pounds of butter a day.

PERHAPS THE PATTERN on which Free Enterprise will be reestablished is the new conception that we are all brothers' keepers. There's a real difference between that policy and the old, callous one of Rugged Individualism,-- and, on the other hand, between that and the New-Fair Deal.

Yours faithfully,

Vernon Mount

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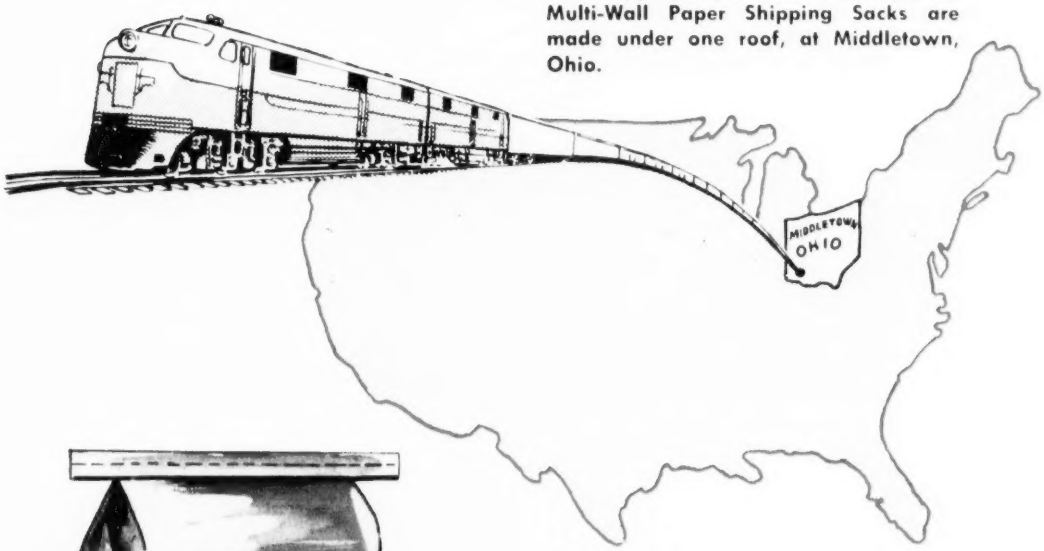

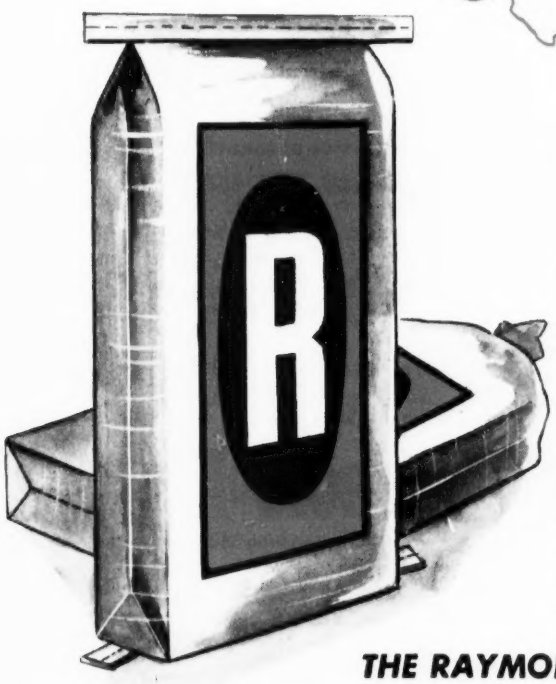

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World Food Supplies Set Record

World food supplies are at record high levels in the current (1952-53) season,[1] according to a report of the world food situation released February 3, by the U. S. Department of Agriculture. Production exceeds all past records for several of the major commodities, including wheat, rice, meats and citrus fruits. Production has been high, though not at record levels for sugar, fats and oils, milk and deciduous fruits.

On the whole, the 1952-53 production of the major commodities, which contribute about 80 percent of the world's total food supply, is estimated at 3 percent above 1951-52 and 9 percent above the prewar average. World population, however, has increased to about 13 percent above prewar.

Despite the increase in world food production in 1952-53, certain areas report a serious food shortage. Yugoslavia and Pakistan, normally exporters of food, are having to import large supplies. Food stocks in South Africa and much of East Africa have been sharply reduced by drought. On the other hand, food supplies in the Western Hemisphere are the largest on record and food production in the Western European countries is the highest of the postwar period.

The world food supply estimates are contained in a report entitled "World Food Situation, 1952-53," published by the Office of Foreign Agricultural Relations. The report is a continuation of the world food summaries OFAR has issued on a yearly basis since 1945. It summarizes the food supply situation in major deficit and surplus producing areas, reviews production and trade of the most essential food commodities for 1952-53, and presents the outlook for winter crops in the Northern Hemisphere.

1 The 1952-53 season refers to the consumption year approximating July 1952-June 1953 in the Northern Hemisphere and the calendar year 1953 in the tropical area and the Southern Hemisphere. Production data for 1952-53 include the 1952 harvest already completed in the Northern Hemisphere and the harvest yet to be completed in the next few months in the tropical areas of the Southern Hemisphere and calendar year estimates of production of meats and milk.

It Seems to Me

by BRUCE MORAN

More fertilizer is an answer to the cost-price squeeze that is troubling the farmers. It costs no more to tend a productive acre than an unproductive one. And the farmer gets a better net as he produces more to the acre.

It is not easy to sell the farmer the idea. He greases his axles because they squeak. But the land seems to go on producing, and it is not until crops consistently fall off that the farmer realizes what he has done to the soil.

It is not only an economic, but a social obligation for all of us who serve agriculture to make sure the land is—in the words of President Eisenhower—passed on unharmed to the next generation. The time is not far off when growing populations will demand all that our farms can produce.

Perhaps all of us should go back and read again the talk we printed last month by Jack Rutland. Perhaps this is the year for salesmen to spend their non-selling season selling.

INDUSTRY CALENDAR

Date	Organization	Hotel	City	State
Mar. 11-13	NAC	Jung	New Orleans	La.
May 7-8	CFA-Soil	Marysville	Marysville	Cal.
June 11-14	APFC	Homestead	Hot Springs	Va.
June 15-17	NFA	Greenbrier	White Sulphur,	W. Va.
July	Canadian	Algonquin	St. Andrews	N. B.
Nov. 9-10	CFA	Theatre	Carmel	Cal.

Table 1. - Preliminary Consumption of Fertilizers in the United States
Year Ended June 30, 1952 1/

State & Region	Consumption				
	Commercial Fertilizers Guaranteed to Contain N, P_2O_5, or K_2O			Minor and Secondary Element Materials 3/	Grand Total All Fertilizers and Minor and Secondary Element Materials
	Mixtures	Materials 2/	Total		
	Tons	Tons	Tons	Tons	Tons
Maine	201,488	14,376	215,834	71	215,905
New Hampshire	15,148	5,793	20,941	81	21,022
Vermont	38,680	17,380	56,030	36	56,066
Massachusetts	74,248	17,746	91,994	85	92,079
Rhode Island 4/	13,200	2,400	15,600	10	15,610
Connecticut	58,548	27,795	86,343	891	87,234
New England 4/	401,262	85,490	486,742	1,173	487,916
New York	486,612	147,713	634,326	592	634,917
New Jersey	241,011	23,854	264,865	117	264,982
Pennsylvania	667,816	96,067	663,883	972	664,855
Delaware	74,109	6,171	80,280	107	80,387
District of Columbia	1,731	810	2,541	0	2,541
Maryland 4/	263,000	26,700	289,700	300	290,000
West Virginia	73,136	26,738	99,873	5	99,878
Middle Atlantic 4/	1,707,414	328,053	2,035,467	2,093	2,037,560
Virginia	739,727	120,383	860,110	8,801	868,911
North Carolina	1,571,194	343,022	1,914,216	27,716	1,941,932
South Carolina	718,301	258,238	976,539	2,562	979,101
Georgia	1,079,363	238,853	1,318,216	14,114	1,332,330
Florida	973,565	93,465	1,067,030	21,669	1,088,699
South Atlantic	5,082,150	1,053,961	6,136,111	74,762	6,210,873
Ohio	983,441	66,020	1,049,461	86	1,049,547
Indiana	934,174	148,440	1,082,614	47	1,082,661
Illinois	592,207	842,094	1,434,301	47	1,434,348
Michigan	536,560	53,949	590,509	412	590,921
Wisconsin	360,858	42,695	393,553	210	393,763
East North Central	3,397,240	1,153,198	4,550,438	802	4,551,240
Minnesota	171,202	52,382	223,584	1,522	225,106
Iowa	277,848	149,076	426,924	4	426,928
Missouri	427,830	325,249	753,079	16	753,095
North Dakota	21,475	9,673	31,148	0	31,148
South Dakota	5,833	5,661	11,294	0	11,294
Nebraska	31,840	60,591	92,431	0	92,431
Kansas	84,586	123,104	207,690	0	207,690
West North Central	1,020,414	725,736	1,746,150	1,542	1,747,692
Kentucky	482,962	147,149	630,101	18	630,119
Tennessee	443,327	159,337	602,664	196	602,860
Alabama	854,344	466,401	1,321,045	484	1,321,529
Mississippi	370,233	454,694	826,927	1	826,928
East South Central	2,151,866	1,227,581	3,379,437	699	3,380,136
Arkansas	188,068	169,987	358,055	1	358,056
Louisiana	179,374	146,298	325,672	6	325,678
Oklahoma	66,018	107,537	172,555	0	172,555
Texas	293,481	313,961	607,442	7,922	615,364
West South Central	726,941	737,383	1,463,824	7,929	1,471,753
Montana	3,279	19,502	22,781	462	23,243
Idaho	11,637	55,759	67,296	4,348	71,644
Wyoming	671	6,010	6,681	75	6,756
Colorado 4/	14,000	30,000	44,000	800	44,800
New Mexico	1,620	17,560	19,080	0	19,080
Arizona 4/	24,800	78,000	102,800	15,000	117,800
Utah	2,679	27,824	30,203	430	30,633
Nevada 4/	360	1,560	1,900	600	2,500
Mountain 4/	58,436	236,005	294,441	21,815	316,256
Washington	26,722	61,939	88,661	2,987	91,648
Oregon	20,298	86,677	106,975	13,338	120,308
California	214,353	747,783	962,136	664,965	1,627,101
Pacific	261,373	896,399	1,157,772	681,288	1,839,057
Continental United States 1951-52 4/	14,806,076	6,444,306	21,250,382	791,800	22,042,182
1950-51	13,640,406	6,222,164	19,862,570	645,350	20,507,920
1949-50	12,038,043	5,502,207	17,538,250	439,382	17,977,632
Hawaii	85,635	60,042	115,677	104	115,681
Puerto Rico	222,103	41,784	263,977	0	263,977
Alaska	117	446	563	0	563
Territories	277,845	102,272	380,117	104	380,221
United States including Territories 1951-52 4/	15,083,921	6,546,578	21,630,499	791,904	22,422,403
1950-51	13,977,350	6,369,449	20,343,299	645,441	20,988,740
1949-50	12,297,896	5,606,197	17,903,793	439,507	18,343,300

1/ Includes fertilizers distributed by Government agencies.

2/ Includes: Ground phosphate rock, basic slag, dried or processed manures but not unmanipulated manures, sewage sludges, and all other materials guaranteed to contain N, P_2O_5, or K_2O supplied for direct use in agriculture. Excludes the quantity of materials consumed in the manufacture of commercial mixtures.

3/ Includes only those materials supplied by manufacturers of commercial fertilizers, such as borax, sulfur, gypsum, metallic salts, not guaranteed to contain N, P_2O_5 or K_2O. Does not include liming materials, or the quantity of minor and secondary element materials supplied through sources other than manufacturers of commercial fertilizers.

4/ Estimated

The quantity of commercial fertilizer consumed in the United States during the year ended June 30, 1952, estimated from data presently available, is 22.4 million tons. This is an increase of 1.4 million tons of fertilizer or 6.8 percent more than the consumption of 20,988,740 tons reported in 1950-51[1]. Commercial mixtures, 15.1 million tons, constituted 67.3 percent of this total. The other 32.7 percent was composed of 6.5 million tons of materials guaranteed to contain N, P_2O_5, or K_2O, and 0.8 million tons of materials not guaranteed to contain N, P_2O_5, or K_2O, mainly gypsum. Consumption of fertilizer, by States, regions, and classes, is given in Table 1. The totals for most of the States are considered complete. The totals for those States indicated as "estimates" may possibly be changed in a later report. The preliminary total for the United States is probably within 75 thousand tons of the final total.

The distribution of fertilizer, by regions, over the ten-year period (1942-43 to 1951-52) is given in Table 2. The use of fertilizer in 1951-52 is 11 million tons (96 percent) greater than in 1942-43. The increase in use of fertilizer during this ten-year period is greater in the East North Central region with 2.9 million tons. In the South Atlantic region, it was 1.8 million tons; and 1.4 million tons in each of the following regions: East South Central, West North Central, and Pacific. The quantity of fertilizer consumed annually in New England has changed little during this ten-year period. The trend in quantity of fertilizer consumed, by regions, is shown graphically in Figure 1.

The relative change in the quantity of fertilizer consumed annually is also shown in Table 2. The increase in consumption for regions along the Atlantic coast has occurred with lesser variations in rates of increases or decreases than for most all other regions. Their weighted average rate of change has ranged be-

1. "Consumption of Commercial Fertilizers in the U. S., 1950-51," Commercial Fertilizer: Vol. 84, No. 6, pp. 20-21, 24-25, 28-29, 34, 36, 40-41 (1952).

PRELIMINARY REPORT ON CONSUMPTION OF COMMERCIAL FERTILIZER IN THE UNITED STATES

YEAR ENDED JUNE 30, 1952

WITH PRECEDING NINE-YEAR TREND

By

WALTER SCHOLL AND HILDA M. WALLACE

Division of Fertilizer and Agricultural Lime,

Bureau of Plant Industry, Soils, and Agricultural Engineering

Agricultural Research Administration

U. S. Department of Agriculture

Beltsville, Maryland

tween 7.8 percent and minus 2.3 percent. For the North Central regions, their rate of increase was greater from 1942-43 to 1945-46, reaching 23.3 percent. From 1945-46, their rate of increase was downward until in 1949-50 consumption was 3.4 percent less than for the preceding year. A rapid recovery was made in 1950-51 when consumption was 18.6 percent greater than for the preceding year but dropped to an increase of 14.9 percent in 1951-52. The average rate for the South Central regions has ranged between 19.0 and 0.9 percent. High increases and low increases have usually occurred in alternate years. The widest range of rate change has occurred for the Mountain and Pacific regions. Their rates have varied between an increase of 72.0 percent to a decrease of 9.3 percent.

In general, the rate of change in the use of fertilizer showed an upward trend from 1942-43 to 1945-46. From 1945-46 to 1949-50, the rate was downward, reaching a low in 1949-50, when consumption was 1.1 percent less than for the preceding year. The rate turned upward in 1950-51 when consumption was 14.4 percent greater than the preceding year and downward in 1951-52 when consumption was but 6.8 percent more than in 1950-51.

Table 2. - Distribution of Fertilizers for Years 1943 through 1952 and Percent of Change, By Regions. 1/

Regions	Years Ended June 30									
	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952
New England										
Consumption-tons	490,411	492,635	493,262	521,288	505,814	535,160	521,255	505,398	456,667	487,915 3/
Percent of Change		0.45	0.13	5.68	-2.97 2/	5.80	-2.60	-3.04	-9.64	6.84
Middle Atlantic										
Consumption-tons	1,464,738	1,547,872	1,622,279	1,680,917	1,776,909	1,796,636	1,856,029	1,893,721	1,956,283	2,037,560 3/
Percent of Change		5.40	4.81	3.61	5.71	1.11	3.31	2.03	3.30	4.15
South Atlantic										
Consumption-tons	4,434,917	4,678,417	4,652,639	5,014,148	5,473,540	5,245,287	5,536,475	5,409,171	6,004,426	6,210,873
Percent of Change		5.49	-0.55	7.77	9.16	-4.17	5.55	-2.30	11.00	3.44
East North Central										
Consumption-tons	1,643,853	1,782,407	2,176,288	2,615,956	3,159,354	3,500,319	3,594,686	3,434,174	3,979,359	4,551,240
Percent of Change		8.43	22.10	20.20	20.77	10.79	2.70	-4.47	16.88	14.37
West North Central										
Consumption-tons	309,814	356,931	462,265	635,630	770,257	1,027,931	1,190,650	1,186,416	1,500,798	1,747,692
Percent of Change		15.21	29.51	37.50	21.18	33.45	15.82	-0.35	26.50	16.45
East South Central										
Consumption-tons	1,932,091	1,880,175	1,968,975	2,215,183	2,266,447	2,776,680	2,941,814	2,840,808	3,206,314	3,380,136
Percent of Change		-2.69	4.72	12.40	2.36	22.52	5.98	-3.43	12.87	5.42
West South Central										
Consumption-tons	546,606	631,423	619,810	789,047	935,365	1,032,880	1,148,466	1,288,031	1,463,858	1,471,753
Percent of Change		15.52	-1.84	27.30	18.54	10.42	11.19	12.15	13.65	0.54
Mountain										
Consumption-tons	48,384	95,371	135,830	143,510	196,527	221,998	183,761	205,369	280,878	316,956 3/
Percent of Change		97.11	42.42	5.65	36.94	12.96	-17.22	11.76	36.77	12.49
Pacific										
Consumption-tons	445,131	606,575	1,070,106	1,190,275	1,423,464	1,334,333	1,227,852	1,214,644	1,659,337	1,839,067
Percent of Change		36.04	76.71	11.23	19.59	-6.26	-7.98	-1.08	36.62	10.83
Continental U. S.										
Consumption-tons	11,305,945	12,070,806	13,201,454	14,803,954	16,506,677	17,470,214	18,200,887	17,977,632	20,507,920	22,042,182 3/
Percent of Change		6.76	9.37	12.14	11.50	5.84	4.18	-1.23	14.07	7.48
Territories										
Consumption-tons	159,383	288,464	264,700	323,725	331,976	348,187	340,998	365,668	480,820	380,221
Percent of Change		80.99	-8.24	22.30	2.55	4.88	-2.06	7.23	31.49	-20.92
United States and Territories										
Consumption-tons	11,465,328	12,359,270	13,466,154	15,127,679	16,838,652	17,818,401	18,541,885	18,343,300	20,988,740	22,422,403 3/
Percent of Change		7.80	8.96	12.34	11.31	5.82	4.06	-1.07	14.42	6.83

1/ Includes: Ground phosphate rock, basic slag, dried or processed manures but not unmanipulated manures, sewage sludges, minor and secondary element materials, and fertilizers distributed by Government agencies. Excludes materials used in the manufacture of commercial mixtures and liming materials but includes gypsum distributed by manufacturers of fertilizers.

2/ Minus sign denotes a decrease.

3/ Preliminary.

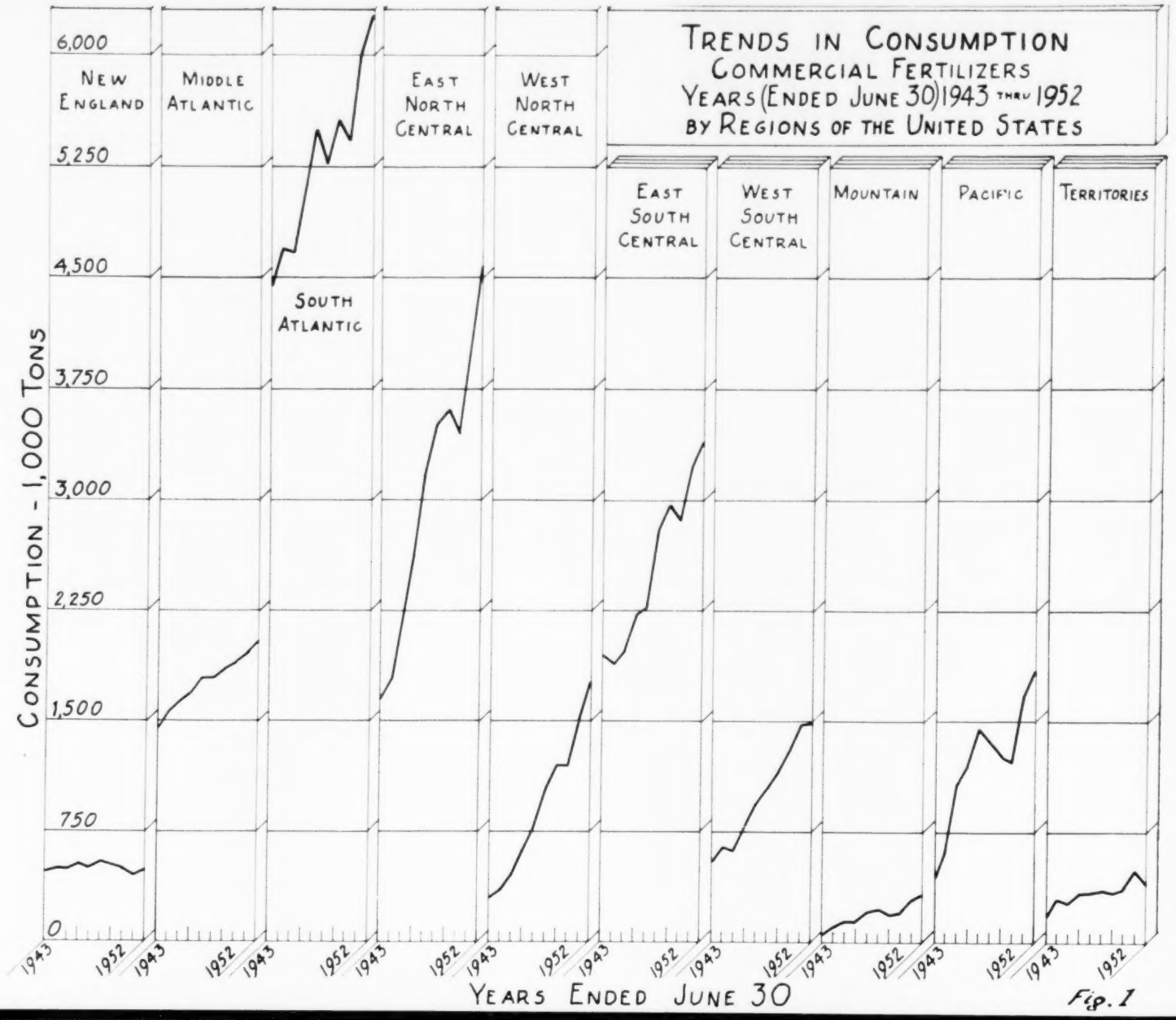
TRENDS IN CONSUMPTION
COMMERCIAL FERTILIZERS
YEARS (ENDED JUNE 30) 1943 THRU 1952
BY REGIONS OF THE UNITED STATES
NEW ENGLAND
MIDDLE ATLANTIC
SOUTH ATLANTIC
EAST NORTH CENTRAL
WEST NORTH CENTRAL
EAST SOUTH CENTRAL
WEST SOUTH CENTRAL
MOUNTAIN
PACIFIC
TERRITORIES
CONSUMPTION - 1,000 TONS
6,000
5,250
4,500
3,750
3,000
2,250
1,500
750
0
1943
1952
YEARS ENDED JUNE 30

Fig. 1

Which WOULD YOU BUY?

THE TWO PHOTOGRAPHS ABOVE WERE MADE ON THE SAME DAY IN THE SAME AREA. — The trees on the left were fertilized with 5-10-10 fertilizer without trace minerals; the adjoining trees on the right received the same fertilizer plus soluble trace minerals. The same amount of fertilizer was used on each block. These photographs were taken after harvest.

THIS FIELD OF SWEET POTATOES was fertilized with 3-9-12 fertilizer containing soluble trace minerals. The two rows on the left received regular 3-9-12 fertilizer with no trace minerals. Note the great difference in growth, resulting in increased yield and improved quality, where the mineralized fertilizer was used.

MINERALIZED FERTILIZER wherever used is producing the remarkable results that the illustrations on this page show. Minerals in minor quantities are just as essential to healthy plant growth and optimum production of vitamin-rich crops as are nitrogen, potash and phosphate. Mineralized fertilizer stimulates sales and creates new business because the results are conclusive. Fertilizers that give superior results are the fertilizers the growers buy . . . Mineralized fertilizers do just that . . . if you were a grower which would you buy?

As basic producers of minerals, we would like to discuss with you, and show you, how to increase your fertilizer tonnage and your profits by the addition of minerals.

We are in a position to supply most any combination of mineral mixtures in large or small quantities.

ZINC MANGANESE BORON COPPER IRON MAGNESIUM

TENNESSEE TC **CORPORATION**

617-29 Grant Building, TENNESSEE CORPORATION Atlanta, Georgia

For further information, phone, wire or write . . . Tennessee Corporation, 617-29 Grant Bldg, Atlanta, Ga.

SUPERPHOSPHATE

SUMMARY FOR 1952 SEASON (JULY 1, 1951—JUNE 30, 1952)

By U. S. DEPARTMENT OF COMMERCE

Production and Shipments by Class of Customer for the United States and for Divisions and States

United States production of superphosphate for the 1952 season (July 1951-June 1952) totaled 11,597,358 short tons (18% A.P.A. basis) and shipments, including interplant transfers, totaled 6,828,012 tons, according to the Bureau of the Census, acting as the collecting and compiling agent for the National Production Authority. About 47 percent of these shipments from superphosphate; 25.6 percent, to distributors and farmers; and the remainder, to other plants of the producing company (interplant transfers), to other superphosphate producers, to the Government, and for export. (See table for detailed statistics.)

All quantities shown in the table below represent combined data for normal, concentrated, and wet-base goods and are expressed in short tons of equivalent 18% A.P.A. (available phosphoric acid) basis. The statistics showing the quantities shipped by class of customer, by Divisions and States, are available for the first time as a result of information furnished on Form NPAF-182, Superphosphate, Manufacturer's Report on Production, Consumption, Shipments, and Stocks, By Quarters in 1950, 1951, and First 6 months of 1952. This one-time survey was conducted by the Bureau of the Census at the request of the National Production Authority for the purpose of furnishing that agency with information needed to determine policies for defense mobilization. These figures are being released in line with the policy of furnishing useful statistics to the public, when consistent with national security.

Data presented in this release were compiled from reports received from all plants known to have facilities for superphosphate manufacture, including government-owned plants. The statistics include estimates made by the reporting companies for the period April 1 to June 30, 1952. Monthly statistics by specified grades, showing production, shipments, and stocks, are available in the Facts for Industry Series M19D, Superphosphate.

All inquiries concerning these data should be addressed to the Chemicals Section, Industry Division, Bureau of the Census, Washington 25, D. C.

Prepared by the Bureau of the Census, Industry Division, Chemicals Section. For sale by Bureau of the Census. Price 5 cents.

SUPERPHOSPHATE: PRODUCTION AND SHIPMENTS BY CLASS OF CUSTOMER, BY DIVISIONS AND STATES 1952 SEASON (JULY 1, 1951—JUNE 30, 1952)

(All grades, in short tons, 18% A.P.A.)

	Production	Shipments and interplant transfers			
		Total	To distributors or farmers	To mixers 1	To others 2
UNITED STATES, TOTAL	**11,597,358**	**6,828,012**	**1,740,546**	**3,213,526**	**1,873,940**
New England[3]	134,882	86,506	(d)	35,428	(d)
Middle Atlantic	547,191	312,169	50,162	205,537	56,470
New Jersey	335,698	197,833	(d)	121,444	(d)
New York and Pennsylvania	211,493	114,336	(d)	84,093	(d)
East North Central	2,305,869	717,835	146,128	259,593	312,114
Ohio	751,656	180,538	32,630	122,785	25,123
Indiana	410,408	125,408	(d)	(d)	49,841
Illinois	829,057	289,301	(d)	(d)	164,986
Michigan	181,099	(d)	(d)	(d)	(d)
Wisconsin	133,649	(d)	(d)	(d)	(d)
West North Central	351,646	112,806	(d)	54,268	(d)
Missouri	161,321	(d)	(d)	(d)	(d)
Other[4]	190,325	(d)	(d)	(d)	(d)
South Atlantic	5,474,450	3,813,894	382,269	2,179,691	1,251,934
Maryland	1,342,813	1,094,850	146,087	505,453	443,310
Virginia	641,726	306,141	(d)	146,364	(d)
North Carolina	544,559	276,944	26,294	187,660	62,990
South Carolina	527,521	330,981	37,397	145,849	147,735
Georgia	809,935	404,760	41,785	272,515	90,460
Florida	1,607,896	1,400,218	(d)	921,850	(d)
East South Central	1,513,853	849,457	475,708	255,376	118,373
Kentucky	44,205	(d)	(d)	(d)	(d)
Tennessee	491,132	177,071	54,879	18,195	103,997
Alabama	766,416	537,519	(d)	142,432	(d)
Mississippi	212,100	(d)	(d)	(d)	(d)
West South Central	790,447	506,053	296,338	153,737	55,978
Louisiana	261,264	161,621	(d)	70,986	(d)
Texas	268,719	140,832	104,041	(d)	(d)
Other[5]	260,464	203,600	(d)	(d)	(d)
West[6]	479,020	429,292	330,232	69,896	29,164

(d) Withheld to avoid disclosing figures for individual companies.
(1) Includes shipments only to plants which do not manufacture superphosphate and are not owned by a superphosphate producing company.
(2) Includes shipments to other plants of the producing company (interplant transfers), to other superphosphate producers, to the Government, and for export.
(3) Includes data for plants in Maine and Massachusetts.
(4) Includes data for plants located in Iowa, Nebraska, and Kansas.
(5) Includes data for plants located in Oklahoma and Arkansas.
(6) Includes data for plants located in Montana, Idaho, Utah, Washington, and California. No shipments were reported from the State of Washington to fertilizer mixers who do not produce superphosphate and no shipments were reported from the States of Montana and Utah to "Other" consumers.

Bankers HAVE LEARNED THAT FINANCING IS THE KEY TO MORE PRODUCTION

In December, Mid-Continent Banker published this article, written by Z. H. Beers, executive secretary of the Mid West Soil Improvement Committee. It is a clear case for the part bankers must play in agriculture, to their own profit. We are glad of permission from the writer and the publication to reprint it here.

There are growing convictions that it is often cheaper to build a fertile soil than to purchase acreage already containing all the necessary soil nutrients. This conclusion is shared by many agricultural economists, farm managers and soils experts throughout the Middle-West.

Millions of acres of this so-called "second-class land" easily could be in the 100-bushel-per-acre corn class if the soil's nutrient level were raised and other good land management practices used. In this category are the Putnam soils of Missouri, parts of Oklahoma, Kansas, Nebraska, Southern Illinois, Southern Indiana and parts of Iowa.

A great percentage of this type of land currently sells for $100 to $125 per acre. It is generally low in fertility, frequently has drainage problems and sometimes requires special management practices. Also, it often lacks organic matter, but it still has the essential framework of good soil —the ability to hold nutrients and to soak up and store water.

Soils analysts estimate that an investment of $50 to $75 per acre in fertilizers and lime, drainage measures and other management practices would build up these second class soils to a point where they would produce (year after year) crop yields equal to the best of the black prairie soils that now sell for $300 to $500 per acre.

Give a farmer some of this second class land, then, add the proper financial backing, and in most cases within one to three years he will show tremendous production increases. This is a new concept of soil building which will open new horizons to communities and their banking institutions.

- **Soil Building.** First of all, if a farmer should approach his banker for a loan to buy a new farm, both the banker and the farmer will want to consider the possibility of purchasing a run-down farm (at a much lower price) and increasing its productivity through the means outlined above.

Secondly, should a community have none of the top-priced black prairie soils, it can literally "lift itself by its own bootstraps" by building up the fertility of the soils it does have. The community, and its bank, can do more than just wish for better soils.

- **New Wealth.** This soil rejuvenation can create new wealth and new purchasing power for the community; it already has done that in many areas throughout the country. Such a program necessarily requires teamwork among bankers, business men, farmers and county agricultural agents.

This teamwork will pay off in more production from every farm acre, and every member of the community will benefit. Extra yields of corn and hay, more gallons of milk, more pounds of beef at a lower production cost—these will be translated into better homes and buildings, schools, roads, new tractors, combines, automobiles, labor saving kitchens, radios, home freezers, modern plumbing, new furniture and new clothing, and electrical appliances that will give relief from back-breaking drudgery in the home, field and barn.

Calling All Bankers . . .

The encouragement of high-yield agriculture is the principal answer to the demand for more food, more feed, and more fiber for America's growing population. Through greater fertilizer use the farmer can realize more profit from every acre.

The farmer needs to know more about the benefits he can secure from fertilizer. But the farmer needs other help, notably loans from the nation's bankers who hold the purse-strings of our economy.

Are bankers—who are among the farmers' most powerful aides—aware of the impressive immediate dollars-and-cents returns from fertilizer use? Do bankers realize that the projected fertilizer expansion means that farmers in 1955 must have some $700 million in additional working capital and that this can come from farmers' own savings, from special credit institutions or from banks? Every one of the nation's bankers should be interested in obtaining or increasing his share of the agricultural business as it booms ahead.

RUSSELL COLEMAN
President, National Fertilizer Association

Fertilizer Sales Soar As Farmers Boost Output

Prewar	Sales, all Fertilizers (Millions of Tons)
1932	4.4
1937	8.2
1940	8.2
War Years	
1943	11.5
1945	13.2

Post War	Sales, all Fertilizers (Millions of Tons)
1947	15.0
1948	15.9
1949	16.4
1950	18.0
1951	18.7
*1952	19.+

*Estimate

Even where soils are comparatively fertile, research men are finding that the soils are producing only about two thirds or less of their potential. Average corn yields for the corn belt stand at less than 50 bushels per acre. Wheat yields run less than 20 bushels per acre. Yet, where water and temperature are favorable, 100 bushels of corn and 50 bushels of wheat per acre are well within the realm of possibility. We have the know-how to accomplish this feat!

• **Increased Production.** This increased production per acre, however, calls for financing. It is estimated, for example, that more than $700 million will be needed to purchase fertilizers that are needed to bring our production levels up to reasonable profit levels. When bankers team up with farmers and county agents and other educators this goal can be achieved.

Financing is a must in order to boost crop yields, which in turn serves to cut the cost of each unit of production. The ultimate of this process is that the farmer will realize more profit per unit of production—more profit per acre. Stated another way: he can sell for less during times of distress yet still remain above the break-even point.

Consider corn as an example. Records show that it costs about $60 per acre to produce an acre of corn. If that acre produces 50 bushels, corn must bring $1.20 per bushel in order for the farmer to reach the break-even point. However, at 75 bushels per acre, the break-even point would drop to 80 cents per bushel; and at 100 bushels per acre, the break-even point would be reached at 60 cents per bushel.

See Pages 28 and 75 For Additional Bank Stories

• **Profits Rise.** Profit-wise the story follows the same pattern. As yields increase, profits rise rapidly. For example, assume an hypothetical price of corn at $1.50 per bushel. The land yielding 50 bushels per acre would produce a profit of $15. A 75-bushel yield would produce a profit of $52.50, and a 100-bushel yield would increase the profit to $90. This pattern shows that as yields double, profit increases six-fold.

Fertilizer is the big factor in increasing crop yields, say the agricultural authorities, and more fertilizer, intelligently used, will help cut the production costs of corn, hay, milk, meat or eggs.

Since 1932, the use of fertilizers has increased almost five times, and reliable estimates call for twice the current use of fertilizer (20 million tons yearly) within the next few years. Applied to large acreages, this increased fertilizer usage will call for bank financing. The banker naturally will ask: "Does it pay, and how soon?"

Average experience shows that a dollar invested in fertilizer brings a return of from two to four dollars to the farmer during the first year. This first-year return, however, does not tell the complete story. Fertilizer, properly used in sufficient amounts, has a carry over effect, and as more is added to the land each year, soils can be expected to build in fertility to bring cinsistently higher yields per acre.

• **Financing a Necessity.** Bankers, who deal with farm customers from-day-to-day, are in a position to know that postwar farming calls for steadily increasing cash outlays for production expenses. The farmer must, if he is to remain solvent, solve the problem of high per-unit costs. Today's farmer also finds himself with many fixed costs and must constantly replace expensive machinery that is so vital to modern farming techniques.

Farmers, hen, must keep their level of production high in order to cope with the problem of rising production costs. Ever present in the background, too, is the prospect of rising populations, which must be fed from fewer and fewer agricultural acres in production. More production is the answer and bankers in the agricultural areas must team up with farmers and agricultural experts to make this production possible.

Fertilizer Consumption in the Mid-Continent Area for 1951

(Short Tons)

Arkansas	415,091
Illinois	560,025
Indiana	891,635
Kansas	161,651
Kentucky	559,274
Louisiana	302,623
Mississippi	764,051
Missouri	465,319
New Mexico	20,015
Oklahoma	152,279
Tennessee	608,969
Texas	568,176
TOTAL	5,469,108
Total fertilizer consumption in the United States in 1951	18,665,748

Hudson foresters choose a stand of prime timber for multiwall Kraft from Hudson's 435,000 acres. They practice selective harvesting, always leaving parent trees to help with the new crop, by natural reseeding.

Careful selection of trees for mechanized cutting gives uniform quality and dependable supplies of raw materials for pulp making.

Every year about 1½ million southern pine seedlings are planted on Hudson tree farms.

Here is why HUDSON can guarantee Multiwall Sacks against breaking on the packer

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Tree farming is big business with Hudson. Every month the company's Palatka, Florida, mill converts 620 freight carloads, 2,515 truck loads, and 10 barge loads of company-grown pine into long-fiber Kraft.

By growing its own trees, Hudson can exert iron-clad control of Multiwall Sack quality and delivery schedules. This is one reason why Hudson can guarantee to replace *without cost* all Hudson Multiwall Sacks that fail on your packing or closing machines.

HUDSON MULTIWALL SACKS

Send for these 3 helpful folders:

"Avoid Breakage," "Dependable Source of Supply," and latest issue of "Sack Sense." Also full details on Hudson's unusual Replacement Guarantee. No obligation.

HUDSON PULP & PAPER CORP.,
Dept. 154, 505 Park Ave., New York 22, N.Y.

BANK SHOWS RECOGNITION OF FERTILIZER VALUE

At the Fifth Annual Soil Fertility Conference, W. R. Allstetter, NFA vice-president made the point that the farmer may well need funds from credit sources for the purchase of additional fertilizer in view of the cost-prize squeeze in which he finds himself today. The same day Russell Coleman, NFA president, issued a statement praising the bankers as "quick to recognize that farming is a business."

So it is interesting to note three items that have come across the editorial desk during the past few weeks on this subject:

One, a report from Peoria, where the Central National Bank and Trust Company is making loans on security ranging from 2 to 1 to 3 to 1, with land, automobiles, machinery and personal property as surety. This is, of course, routine in many banks. But in Peoria a soil test precedes the loan, and fertilizer is recommended on the basis of crop needs and the financing is tailored accordingly.

All the loans by the bank last year were made through the Shrock Fertilizer Company, which has a standard work sheet for crop recommendations. The banker takes this sheet, visits the farm and goes over plans with the farmer.

The other two were sent us by Warren Garst of the Home Bank in Jefferson, Iowa—who will be remembered as one of the most interesting speakers at the Miami NFA convention. These are taken from "The Home Bank Notes" a bulletin mailed to the surrounding community, the contents of which are also run as advertising in the local papers.

From "Home Bank Notes"

What Does It Cost To Raise Corn?

The folks at the USDA have figured on Corn cost—as of 1946. They say there was a fixed cost of $48.30 per acre, which covered plowing and planting and cultivating, and picking, and hauling to market. It also covered the work of spreading manure and starter fertilizer—the seed costs, the rent of the land or the land investment if you owned the land.

Then they figured the value of the nitrogen, phosphate and potash that a crop takes out of any field (whether you use fertilizer or not)—but they allowed for the elements that were plowed back in the form of stalks etc. On a 30 bu. per acre yield, the "Net Fertility Cost" was $4.55 an acre. When the yield was 50 bushels to the acre it ran $7.49. At 80 bushels to the acre, the net fertility cost was $12.17. Note that the fixed operating costs are a lot higher, in all cases, than the value of the fertility taken out of the soil.

That made the total cost (fixed costs plus fertility costs) come out to $1.76 a bushel for the corn crop, when 30 bushels were raised to the acre. When the yield went up to 50 bushels to the acre the cost per bushel dropped to $1.12 a bushel. At 80 bushels to the acre, it dropped again—this time to 76c a bushel. You can carry that on down to 63c a bushel for total cost if you want to figure on 100 bushels to the acre.

The cost of the fertility is so small, as compared to the fixed cost, that you cannot afford to let fertility limit your crop.

Suppose we use a heavy fertilizer application—and increase corn yields from 50 bushels to the acre and run it on up to 80 bushels to the acre. This has been done lots of times by lots of men right here in Greene County over the last 5 years.

The cost of that added fertilizer plus the fixed costs figured over that bigger yeild brings down the cost per bushel. You actually make more money—by spending money.

Instead of fertilizer costing you money—it produces a profit for you. In a way it is like the boy's definition of salt: "the stuff that spoils potatoes when you don't put any on." Fertilizer cost you money when you don't use it.

Want to talk about fertilizer for next year? Come on in—anytime. We love to talk to folks who have a plan and who know where they are going.

——HB——

A Friend Suggests

"There are two ways you can run that 40", said a friend recently. One way would be to raise corn, then oats and then a year of clover. That's a good ration—and your results might well be:

70 bushels of corn at $1.50 or	**$105.00**
50 bushels of oats at 60¢	**30.00**
Clover at cash rent rates	**8.00**
Per acre income in 3 years	**143.00**

Or change the plans and use fertilizer applications that would cost $48.00 per acre for the 3 year period but with some on each year according to the crop. The results that you might get then could look like this:

80 bushels of corn at $1.50	**$120.00**
80 bushels of corn at $1.50	**120.00**
60 bushels of oats at 60¢	**36.00**
	276.00
Deduct fertilizer cost	**48.00**
Net return for 3 year period	**228.00**

What about humus or plow under vegetation? Our friend says that heavy fertilizer produces big, heavy stalks and lots of stubble—and that the total plow under would be 2 times more than with the first rotation.

Is the idea worth while? Our friend has been running his land this way for 10 or 12 years now—and has regularly averaged more than 80 bushels of corn to the acre. Some of his land this year went 90-100 and on up to 120 bushels to the acre.

Want some fertilizer for your place for 1953? We'll talk fertilizer or fertilizer loans with you any time. Come on in.

Breaking all previous attendance records, the annual joint meeting of Midwestern college agronomists with fertilizer industry representatives drew more than 400 to the Palmer House in Chicago to hear reports on research pointing the way to more effective use of fertilizer.

Sponsored by the Middle West Soil Improvement Committee, this meeting has been steadily growing in interest and attendance over the years.

More than 100 companies and organizations plus 13 state colleges and federal government departments were represented by those signing registration cards.

Dr. Harold E. Myers, associate director of the Kansas Agricultural Experiment Station presided.

Presenting reports were Dr. W. A. Albrecht, Chairman of the Soils Department, University of Missouri; Dr. John T. Pesek, associate professor of agronomy, Iowa State College; Dr. Floyd W. Smith, professor of agronomy, Kansas State College; Dr. L. M. Turk, head of the soils department, Michigan State College; W. R. Allstetter, vice president of the National Fertilizer Association, Dr. Garth Volk, head of the agronomy department, Ohio State College, appearing in the place of Dr. J. B. Peterson, head of the agronomy department, Purdue University, presented the agronomists' recommendations for minimum fertilizer grades in 13 Corn Belt States for the year beginning July 1, 1953.

Agronomists attending the meeting and taking part in the discussions were: William A. Albrecht, University of Missouri; S. A. Barber, Purdue University; F. C. Bauer, University of Illinois; William F. Bennett, Iowa State College; K. C. Berger, University of Wisconsin; Burton L. Brage, South Dakota State College; Paul M. Burson, University of Minnesota; C. J. Chapman, University of Wisconsin; R. L. Cook, Michigan State College; E. E. DeTurk, Good Farming,—formerly of University of Illinois; E. R. Duncan, ISC; George H. Enfield, University of Purdue; E. F. Frolik, University of Nebraska; W. H. Garman, Office of Experiment Stations; Maurice R. Haag, American Society of Agronomy; P. E. Karraker, University of Kentucky; Arnold Klemme, University of Missouri; John M. MacGregor, University of Minnesota; W. P. Martin, Ohio State University; A. Mazurak, University of Nebraska; Henry J. Mederski, Ohio Station; L. G. Monthey, American Society of Agronomy; Harold E. Myers, Kansas State College; E. B. Norum, North Dakota Agriculture College; A. J. Ohlrogge, Purdue University; R. A. Olson, University of Nebraska; R. V. Olson, Kansas State College; R. Q. Parks, U.S.D.A.; John T. Pesek, Jr., Iowa State College; Leo F. Puhr, South Dakota State College; H. F. Rhoades, University of Nebraska, Bill Seay, University of Kentucky, G. E. Smith, University of Missouri, Emil Truog, University of Wisconsin, Martin E. Weeks, Tennessee Valley Authority, M. D. Weldon, University of Nebraska, and J. C. Zubriski, North Dakota Agricultural College.

In welcoming the agronomists and industry members to the meeting, J. D. Stewart, Federal Chemical Co., Louisville, Ky., president of the Middle West Soil Improvement Committee, cited three major benefits of the meeting: 1—It keeps the fertilizer industry posted on state by state results of fertilizer research; 2—It provides a mutual exchange of ideas on problems affecting the use and distribution of fertilizer and thus helps promote the welfare of the industry and makes more practical the research projects undertaken by the colleges; 3—The opportunity it affords college agronomists in the North Central area to

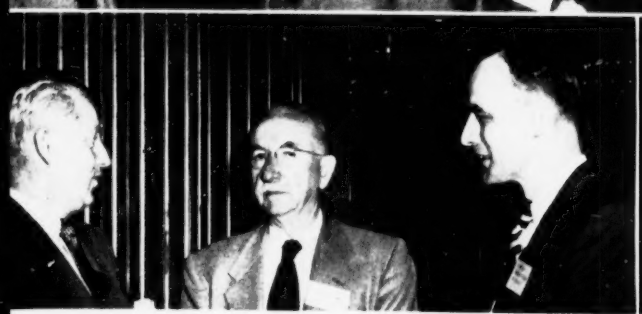
ON THE PODIUM, CHICAGO MEET

1. J. D. Stewart, Federal Chemical Co., president of MWSIC, welcomes agronomists industry members to meeting. 2. Dr. R. L. Cook, Michigan State College. 3. Dr. J. T. Pesek, Iowa State College.

KEY TO PICTURES

1. Tracy Adcock, Swift & Co., and Dr. W. A. Albrecht, chairman Soils Dept., U. of Mo. 2. Dr. Harold E. Myers, Kan. State College, and Senas H. Beers, exec. Secretary, Middle West Soil Improvement Committee. 3. Frank Calvin, Farmers Union Central Exc., H. C. Zuch, Farmers Union Central Exc., A. L. Milburn, Minn. Farm Bureau Service Co., Dr. E. B. Norum, N. Dakota State College. 4. K. C. Berger, U. of Wisc., Nelson White, Smith Agric. Chem. Co., and Garth Volk, Ohio State Univ. 5. Dan Williams, Minn. Farm Bur. Service Co., Dr. Leo F. Puhr, S. Dakota State College, Burtin L. Brage, S. Dakota State College and Harold Goewey, Minn. Farm Bureau Service Co. 6. Howard K. Morgan, Diamond Fert. Co., W. B. Copeland, Smith-Douglass Co., Inc., and Wm. Newman, Price Chemical Co. 7. W. P. Glaspey, Blue Valley Fert. Co., Dr. Harold F. Rhades, U. of Neb., and Paspar Peters, Phillips Chem. Co. 8. R. P. Koos, N. S. Koos & Son, Prof. C. J. Chapman, U. of Wisc., and J. J. Devlin, Southwest Potash Corp. 9. Jim Gillie, Thurston Chemical Co., Richard E. Bennett, Farm Fertilizers, Inc., and Howard L. Peterson, Lincoln Service & Supply Co.

MID-WEST SOIL IMPROVEMENT MEETING, CHICAGO



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discuss regional cooperation in research, has resulted in faster programs with less duplication and smaller expense.

As one agronomist put it, "These meetings have made it possible for both the soils men and the fertilizer people to understand the various problems in fertilizer manufacture and the use of plant food by farmers in a way not possible without such meetings . . . in fact, because of these annual meetings the Middle West area has been a leader in many fields of fertilizer formulation and use to such an extent that other sections of the country have sort of envied us and wondered why we have been able to do this. The work of the Middle West Soil Improvement Committee in providing funds for out of state travel to bring college men together must be given credit for much of this progress."

Preceding the Friday meeting, the agronomists met in Chicago for two days in a conference of the North Central Region Soils Research Committee.

Keynoting the program on Friday, Dr. W. A. Albrecht discussed "Some Aims of Soil Research." He stressed that research must represent a new theory, a new idea, some new causal connections, new explanations and new results.

"Research in its evolution of new knowledge usually includes four steps or phases," he said, "namely, 1 — Observations; 2 — Theories prompted by observations; 3 — Experimental tests of the theories; and 4—Conclusions drawn from the results of the tests. If any of these phases are omitted, if any are out of proper sequence, or if they are in error, a new fact or truth will not be established, and thereby the results will fail to be research in the strictest sense."

Dr. Albrecht said that what soil research is aiming to do depends on the individual who is aiming. It will depend, too, he said, "not on a majority vote of any scientific body assembled, nor on agronomists grouped according to geographic, agricultural or economic categories. Rather the aim of research will be higher as the vision of the researcher can be extended by more basic facts at his command for projection of this thinking far enough into the unknown for maximum benefit to agriculture and all that is dependent on it."

Discussing "Time of Application of Fertilizer," Dr. John T. Pesek, reported that corn yields can be increased as much or more by fertilizer added in the fall as in the spring. Superphosphate plowed under in the fall gave consistently higher yields than when it was disked in in the spring on fall plowed land. Yields from potash plowed under in the fall were slightly larger than when the fertilizer was added in the spring. Dr. Pesek said that the better responses from fertilizer plowed under in the fall probably resulted from the slight banding effect associated with turning the phosphate under.

"On the basis of results obtained in 1952," he said, it is considered an acceptable practice to plow under the phosphorus and potash fertilizers in the fall where fall plowing is the practice, and where the need is indicated for such quantities of fertilizer as are normally broadcast and disked in before planting. This is not intended to substitute for hill or row applications of fertilizer which should still be made."

"Fall applications may contribute substantially to increase fertilizer use in Iowa and possibly other Middle West states," Dr. Pesek said. It would thus considerably extend the fertilizer season. It would enable farmers to fertilize the land for next year's corn crop during the fall months when they have more working time. This would spread out the buyer demand, extending the time when fertilizer moves from factory to farm, so that it does not pile up in storage.

Crop yield tests on the time and rate of applying superphosphate showed that split applications divided between the oats and either the second year meadow or the corn, gave best results. Corn yields averaged 63.2 bushels when 60 pounds of superphosphate was added to the oats and 60 to the corn. This was 17.4 more bushels than when 120 pounds was added to the oats three years previous to the corn crop. When half the phosphate went on the oats and half on the meadow, the yield was 60.8 bushels, or a 9 bushel return from splitting the application.

Summarizing research results by various Kansas soils specialists over a 5-year period, Dr. Floyd W. Smith reported that:

1—Farmers will get about as many bushels of corn regardless of the time of year fertilizer is added; or whether application method includes broadcasting ahead of planting, deep-placement at planting time or side dressing with ammonium nitrate.

2—Increases in wheat are virtually the same whether anhydrous ammonia or ammoniating solutions are injected into the soil; or whether dry nitrogen fertilizer is added by conventional methods.

3—More bushels of wheat per acre are obtained by drilling in the fertilizer at seeding time or placing it on the plowsole, than by broadcasting the fertilizer on the stubble ahead of planting.

4—In most instances, the time of application of nitrogen fertilizer for wheat is not an important factor so fas as yields are concerned. Yields were 36.1 bushels per acre, or 12.2 bushels higher than on unfertilized soil, when 50 pounds of nitrogen was added at seeding. Yields were 36. (bushels per acre when the application was split—25 pounds of nitrogen added December 20 and 25 pounds at seeding. Yields were 36.8 bushels when 25 pounds was added at seeding time and 25 pounds on March 30.

5—Nitrogen fertilizer sprayed on the foliage of wheat is less effective in boosting yields than are applications of fertilizer made directly to the soil.

6—Spraying nitrogen fertilizer on wheat foliage has increased protein content more than it has yields per acre, especially when the spraying is done in late April or May.

7—Considering that profits from fertilizer use depend more on extra bushels per acre than on more pro-

1. E. R. Duncan, Iowa State College, S. C. Smith, Darling & Co., H. S. Vorhes, Va.-Carolina Chem. Corp. 2. A. J. Ohlrogge, Purdue Univ., and F. E. DeTurk, retired from Univ. Illinois. 3. Ove Jensen, Du Pont, A. R. Mullin, Indiana Farm Bureau Coop., Cash Cahill, Rath Packing Co. 4. A. H. Bowers, Kirk Wagenseller, Walter Klossner, A. N. D'Arcy, and R. A. Culbertson, all of Swift & Co. 5. J. Ward Cleland, National Soybean Crop Improvement Council, Charles F. Martin, Miami Fertilizer Co., R. R. Poyner, International Harvester Co., George Enfield, Purdue Univ., C. R. Martin, Miami Fertilizer Co. 6. Bill Seay, U. of Kentucky, A. W. Klemme, U. Of Missouri, Leo Orth, Minn. Farm Bureau Service Co. 7. T. L. Adcock, Swift & Co., John Sargent and Bob Nash, Federal Chemical Co. 8. R. Q. Parks, USDA, Ed Kitchen, Pacific Coast Borax Co., L. W. Nelson, USDA. 9. Warren Huff, Ashcraft-Wilkinson, R. A. Garn, Farm Bureau Coop. Assn., Ohio, H. S. Vorhes, Va.-Carolina Chem. Corp. 10. Allan Letler and E. O. Johnston, Iowa Plant Foods, Fred Ioeger, National Fert. Co., H. G. N. Hoffer, Amer. Potash Inst., H. H. Douthit and John Zigler, Int. Min. & Chem. Corp.

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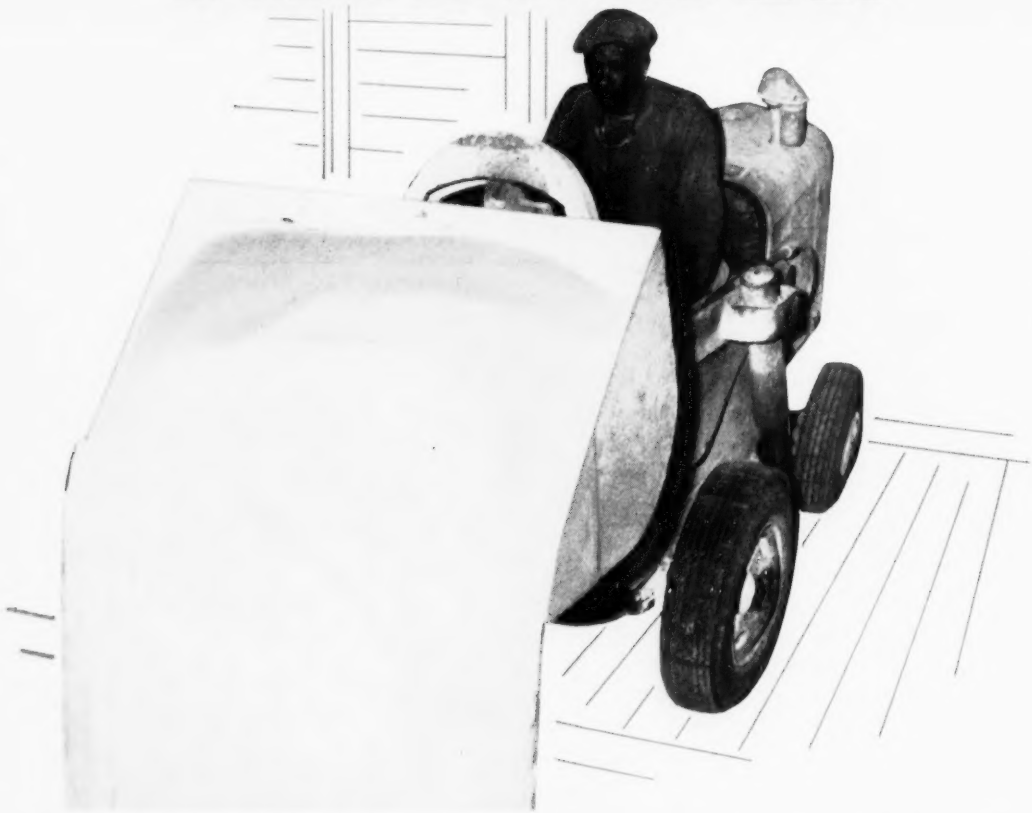

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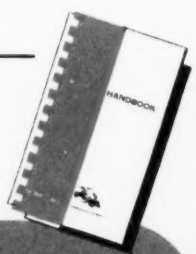

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Members of Soil Improvement Committee, Pacific Northwest Plant Food Association, met recently with the board of directors to outline plan for an Oregon Demonstration Farm Project.

Left to right: Geo. Wickstrom, Chairman Soil Improvement Committee, representing American Potash Institute; Bob Whiting, Swift & Co., Portland, member of Committee; Henning Waltersdorph, Magnolia Fertilizer Co., Seattle, member of board; Kyman Judson, Lynden Dept. Store, Lynden, Washington, member of board; Leon S. Jackson, Association Secretary; E. B. Shipley, Swift & Co., Portland, Association President; Harold Rud, Simplot Fertilizer Co., Salem, board member; Frank Meeker, Meeker-Hughes Co., Salem, Association Treasurer; Lee Frayer, Chas H. Lilly Co., Seattle, board member; Sid Martin, Yakima Valley Spray Co., Yakima, Wash., board member; Otto Schell, Chas. H. Lilly Co., Albany, Ore., committee member.

The farm demonstration will include setting up a complete fertilizer program for a farm as yet not selected, after making soil analyses of different portions of the land. The project will be supervised by the soils department of Oregon State.

tein, it will pay better to add dry nitrogen to wheat via conventional methods of application.

Reporting on research on granular versus pulverized fertilizer from the standpoint of yields and nitrient intake by crops, Dr. R. L. Cook, of Michigan State College, cited tests in which radio-active superphosphate was used in growing wheat and field beans. In greenhouse studies, the research men found that granulation did not increase or decrease yields as compared with pulverized fertilizer. But banding the fertilizer, i.e. putting the fertilizer in bands near the seed, did increase yields, whether granular or pulverized superphosphate was used. Again, granulation did not increase the uptake of superphosphate by the wheat or bean plants, but banding did. Sampling of dry wheat tissue on four different dates showed that where the fertilizer was banded, the plants contained considerably more phosphorus derived from the fertilizer, in 14 out of 16 cases. The same was true of field beans.

In further 1952 tests where spring wheat was grown in the greenhouse on 10 different soils, the use of granulated superphosphate did not increase the percentage of fertilizer phosphorus in the plants. But when the fertilizer was placed near the plants by banding, the percentage of phosphorus in the plants showed a marked increase. On some soils, this ran from two to four times as much as when the superphosphate was mixed with the soil.

Pointing out that research on granulated versus powdered fertilizer is still limited in extent, Dr. Cook said that further tests are already in progress or are planned for 1953.

Dr. Cook pointed out that one advantage of granulation is that it makes the fertilizer easier for farmers to handle. Granulation helps prevent fertilizer from caking in bags during storage. Granulated fertilizer can be distributed more easily uniformly in the field. There is less dust loss when the fertilizer is broadcast or drilled in windy weather.

Opening the Friday afternoon program, Dr. L. M. Turk reported on the "Program for Increased Lime and Fertilizer Use," in which the U. S. Department of Agriculture, the Association of Land Grant Colleges and the lime and fertilizer industries are sponsoring a nationwide program to increase soil productivity. His report was prepared in cooperation with Ed Longnecker of the College's staff.

"The proper use of fertilizer is an important factor in reducing crop production costs," said Dr. Turk. "Research work indicates that at least 200 pounds per acre of high analysis fertilizer can be used profitably on crop and open pasture land.

"There are many situations where much more than this can be used profitably. In Michigan alone, 200 pounds of fertilizer applied to 12 million acres of crop and non-wooded pasture would amount to 1,200,000 tons of fertilizer. This is 221 per cent of the amount used in 1951, while the proposed 1955 fertilizer production amounts to 158 per cent of the 1951 production."

Dr. Turk pointed out that fertilizer is a "good buy." Based on 1910-14 prices, fertilizer prices now stand at 142 and farm commodity prices at 300. Present activities of the Extension Service in promoting greater commercial fertilizer use, include field demonstrations involving the use of fertilizer at different rates on alfalfa, corn, beans, potatoes, wheat and pasture. The program also encourages farmers to use soil testing facilities. It also includes field days, tours, discussion meetings, news stories, radio and television programs.

In a report on "Disposition of Proposed Future Fertilizer Output," W. R. Allstetter declared that recommended rates of application and farmer use of fertilizer will move up faster in the Midwest than in any other part of the nation in the years immediately ahead. He cited U. S. Department of Agriculture estimates that nitrogen use in 1955 will be 204 per cent greater than in 1951; phosphate, 80 per cent greater; and potash, 73 per cent.

The opportunity for fertilizer use expansion, he said, is the difference between what college agronomists are recommending and what the farmers are using. In 1950, for example U. S. farmers used 113 pounds per acre of fertilizer on corn, whereas college agronomists recommend using 244. Farmers used 50 pounds per acre on wheat, as against a recommended rate of 101 pounds; and 22 pounds on grasslands, compared with recommendations of 158 pounds.

"College recommendations are based on research," Mr. Allstetter said. Our opportunity is thus created by research, and the extent to which our opportunity expands depends on the time, money and facilities devoted to research and the dissemination of the knowledge derived from research.

"In other words, the future opportunities for the fertilizer industry are dependent upon the resources of the Soils and Agronomy Departments of the Land-Grant Colleges. And inevitably this dependence of our industry upon college research will increase as time goes by.

"Putting it very bluntly, it is to the direct interest of this industry to do everything in its power to see that adequate and increased personnel and facilities are made available to Soils and Agronomy Departments."

Summing up, Mr. Allstetter said:

1—The opportunity exists for profitable use of more fertilizer than can possibly be used within the next few years.

2—This great opportunity for profitable use is created by our agricultural colleges.

3—Taking advantage of the opportunity is largely a job of showing farmers that following fertilizer recommendations is profitable.

4—In the light of the current market outlook it has become an urgent economic necessity for the individual farmer to cut his costs of production by increased and proper use of fertilizer.

"In short," he said, "the stage is set for the disposition of the increased future supplies of fertilizer. From now on, it just depends on how well we do our job."

The program's concluding feature was the presentation by the agronomists of recommended fertilizer grades for 1953.

During the two days preceding the meeting, the Middle West Soil Improvement Committee, in cooperation with radio stations WGN and WLS in Chicago, arranged for broadcasts in which the agronomists talked to farm audiences about soil building methods, crop responses to fertilizer, methods and amounts of fertilizer application that will give high crop yields and greater profits per acre. Among agronomists making "live" appearances or being interviewed by transcription were: Dr. L. M. Turk, Prof. Emil Truog, Dr. M. B. Russell, Dr. A. J. Ohlrogge, Dr. Floyd W. Smith, Dr. R. L. Cook, Dr. J. B. Peterson, Dr. C. O. Rost, Dr. W. A. Albrecht, Dr. Arnold Klemme, Dr. Harold F. Rhades, Dr. Garth Volk, Dr. W. P. Martin, Dr. George N. Hoffer, midwestern manager American Potash Institute, and Prof. C. J. Chapman and Dr. John T. Pesek.

NFA-TVA Report On 11-11-11 Costs

National Fertilizer Association, working with TVA, have made a study of the cost of producing an 11-11-11 grade of nitraphosphate fertilizer at Sheffield, Alabama, Chicago and at Baltimore. For comparison they have shown the production costs of conventional mixing at the same points. The data is consolidated into a report being supplied to the membership.

Corn Borer Cost $77 Million In 1952

The European corn borer destroyed an estimated 53 million bushels of this important feed crop in 1952, the U. S. Department of Agriculture reported recently. This loss ($77 million at Dec. 15, '52 corn prices), equals 1.7 percent of the 1952 corn crop of more than three billion bushels.

In 1951, the European corn borer caused the loss of nearly 36 million bushels—1.2 percent of the total crop that year. Department entomologists attribute the higher percentage loss in 1952 mainly to increased abundance of the corn borer in Iowa, Illinois, and Minnesota. They point out that although the trend of the 1952 loss was upward, following two years decline, it is much lower than the 1949 record loss of 314 million bushels of corn.

Loss estimates are based on borer populations determined in the fall of 1952 by State agency surveys, and were compiled by the USDA's Bureau of Entomology and Plant Quarantine.

A view of some of the more than 400 who attended the joint meeting of the college men with the fertilizer industry sponsored by the Middle West Soil Improvement Committee in Chicago recently.

USDA COTTON PROGRAM

Following is the text of recommendation on cotton production and marketing problems made February 12 to Secretary of Agriculture Ezra Taft Benson by agricultural and cotton industry leaders at a conference held in Washington:

"The drop which has taken place in cotton exports is the most serious problem currently facing the cotton industry. It is of utmost importance to cotton producers that every effort be made to maintain and expand our export outlets. Failure to sell more cotton abroad will mean unsatisfactory cotton prices and will make it necessary for farmers to reduce their production drastically. Any substantial reduction in cotton acreage would force farmers to expand the production of other commodities and this would have serious repercussions throughout agriculture.

"We recommend immediate action to provide:

(1) Insurance for domestic exporters against war risk, confiscation, and seizure of cotton stored in foreign countries to facilitate the immediate movement of cotton to foreign countries and the rebuilding of stocks to adequate levels.

(2) Special financing, as needed, (through normal channels insofar as possible) to facilitate the movement of American cotton to foreign countries for consumption and to maintain adequate merchant and mill stocks in importing countries such as were maintained prior to World War II.

(3) The procedural details of the MSA cotton procurement authorizations and the Export-Import Bank cotton credits be simplified as much as possible to expedite sales and shipments of cotton to foreign markets.

(4) The Department of Agriculture should lend assistance and encouragement wherever possible to efforts to expand consumption of cotton around the world. Particular attention should be given to research, increased productivity, advertising and sales promotion, economic development, and the reduction of trade barriers.

(5) The Department should cooperate in developing and carrying forward an intensified program that will aid spinners of the world in utilizing the outstanding properties of the cotton fiber to the fullest extent possible. Special attention should be given to pointing out the improved properties that have been developed in the United States cotton.

(6) All agencies of government operating in foreign fields should place increased emphasis on problems of marketing agricultural commodities. OFAR (Office of Foreign Agricultural Relations) in particular should concentrate attention on marketing and should station abroad sales-minded people who know commodities, sales and government.

(7) Liberalize international trade policy as a means of maintaining a high level of international trade. Devote all efforts to achieve convertibility of currencies.

(3) We recommend that the Secretary of Agriculture appoint a temporary committee to intensively study immediate cotton export problems, make recommendations, and work with the Department of Agriculture, other government agencies, producer groups, and the cotton industry to stimulate cotton exports in every way possible.

(9) The present cottonseed support program is unsatisfactory and probably will result in purchase by the CCC (Commodity Credit Corporation) of one-half the 1952-53 production of oil, meal and linters. We, therefore, recommend that the Secretary of Agriculture appoint a committee of representative producers, ginners and crushers to make recommendations.

(10) Agriculture research and its application by farmers has greatly contributed to more efficiency in the production of food and fiber and is the basic element in providing the opportunity for farmers to achieve a high net spendable income. We recommend that greater emphasis be given to research and education in the U. S. Department

25 MILLION BALES?

Hugh Comer, distinguished textile man, farmer and citizen of Alabama predicted that within a lifetime the US could consume an annual cotton crop of 25,000,000 bales—if mechanization, research and agronomist-industry relations made it cheap enough.

Benson Appoints Cotton Export Committee

Secretary of Agriculture Ezra Taft Benson February 13 named a seven-man committee to study the cotton export situation and make recommendations directed at enlarging the foreign market for this crop.

The committee, in addition to its chairman, D. W. Brooks, general manager, Georgia Cotton Producers Assn., Atlanta, Ga., includes: Lamar Fleming, Jr., president Anderson Clayton Co., Houston, Tex.; C. R. Sayre, president, Delta Pine & Land Co., Scott, Miss.; William A. McGregor, vice president, Guaranty Trust Co., New York, N. Y.; Everett R. Cook, Cook & Co., Memphis, Tenn.; Charles H. Cannon, president, Cannon Mills, Kannapolis, N. C., and Walter L. Randolph, president, Alabama Farm Bureau Federation, Montgomery, Ala.

The committee, which will intensively study immediate cotton export problems and make recommendations for the stimulation of foreign markets, especially during the current marketing year, held its first meeting in Washington February 11. It is one of two temporary committees recommended at a meeting yesterday (February 12) by an industry group called in to discuss cotton production and marketing problems with the Secretary and other officials. The other committee will be concerned with the cottonseed price support program.

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Plants Trona and Los Angeles, California

of Agriculture. Investments in research and experimentation should be expanded. We will support an increased appropriation for significant agricultural research in production, marketing and utilization on a grant-in-aid basis. We believe that a solution can be found to many of the problems in the cotton industry through this expanded research and education program.

(11) Extend the maturity date for 1952 CCC cotton loans for one year beyond July 31, 1953.

(12) Recommend that 1953 cotton loan procedure be similar to procedure used in 1951.

(13) An educational campaign by the regular educational agency of the Department of Agriculture and producer groups, among cotton growers to increase their awareness of the need for export outlets; to focus attention on the need for a downward adjustment in production in 1953 in order to keep supplies in line with probable needs; and to explain to the producers the relation of 1953 plantings to future allotments under present law."

USDA Plant, Soils, and Engineering Annual Report

Development of a more productive agriculture profitable to farmers and assuring sustained abundance to meet the needs of consumers is the objective of research described in the annual report of the chief of the Bureau of Plant Industry, Soils, and Agricultural Engineering, released by the U. S. Department of Agriculture. The report gives many examples of scientific findings that will contribute to more efficient farming.

In the future, Bureau Chief A. H. Moseman declares, U. S. agriculture will become more complicated and technical. It will, however, be based soundly on a foundation of scientific facts. "It is the business of research to develop these new facts", he adds, "and it is wise to remind ourselves that a dynamic, progressive agriculture depends a great deal on an alert and progressive research program."

The report describes progress that is being made in many lines of plant development. One method of increasing production that is emphasized is the development of plant varieties with inherent ability to produce even under unfavorable conditions. Quality is likewise emphasized as essential to maintain or increase the nutritive value of products available to consumers.

Altogether the report lists some 50 new and improved crop varieties released during the year (July 1951 through June 1952) in cooperation with various State agricultural experiment stations. These range from new wheats for the Pacific Northwest, the Great Plains, and the Southeast to new corn hybrids for the South, new tree fruits for the northern Great Plains and a number of small fruits for other areas, and castorbeans that yield more beans with a higher oil contend. Each of the new varieties is tailored to meet specific conditions or is adapted to a certain area.

Progress also is indicated along many other lines such as developmen of single-germ sugar beets, advances in soybean hybrids, new techniques of chemical weed control, and basic understandings of plant growth that may give scientists new leads for further breeding for disease resistance.

BENSON WARNS AGAINST COTTON SURPLUS

Reminding cotton farmers that too big a crop this year would result in production and marketing controls for 1954, as well as a depressing effect on prices, Secretary of Agriculture Ezra Taft Benson February 19 issued a statement regarding the cotton situation.

"The good cotton crops of the past two years have supplied the needs for domestic consumption and exports," said the Secretary, "and they have also rebuilt reserve supplies. Export demand has also been falling off from the levels of recent years. It will therefore, not be necessary, or desirable, for farmers to produce as big a crop this year. A production of 12 to 12.5 million bales now appears to be desirable in 1953.

"Planting reduced nationally by about 18 percent from 1952 would, with average yields, produce a crop of 12 to 12.5 million bales. Based on present estimates farmers should, on the average, plant less than five acres this year for each six planted last year, if they are to avoid a proclamation of marketing quotas for the 1954 crop, under the provisions of the controlling legislation. Good land use on some individual farms may require even greater reductions than the average. Supplies above the 'quota' level would of course have an adverse effect on prices."

Total disappearance of cotton during the 1953-54 marketing season, both domestic and export, may be 13 to 13.5 million bales, the Secretary explained. A carry-over of about 4.1 million bales on August 1, 1953, is now indicated. With the suggested rate of disappearance, a 1953 crop of 13 million bales (which is the amount of the goal previously announced) would bring the supply situation dangerously close to the quota level provided in the controlling legislation.

Lawsy THERE GOES OUR BARBECUE!

A Report of the Fertilizer Section Safety Meeting, Mar. 2-3

There is probably no more dedicated group of men in industry than those who watch over Safety in fertilizer plants and mines. The emotional acceptance speech by Mike Ellison, Mississippi Chemical's protection supervisor, on his election as Chairman of the Fertilizer Section, Southern Saftey Conference. He is haunted by sightless eyes, twisted limbs, bereaved families—and his first thought is for those workers. The economics of safety naturally follow.

The essence of the meeting is that safety must be believed in and practiced from the top brass to the lowliest Georgia buggy pusher—and the headline above represents that attitude:

E. F. Carnell said it. He is superintendent of Davison's Savannah, Georgia operation. There they hold a great barbecue every year that shows a no-lost-time accident record. So deeply does this enter the minds of the entire crew that when a man ran a payloader off the edge of the dock, jamming himself and the machine between dock and a freight car . . . the first thought of a bystanding Negro, uttered with a plaintive wail—"Lawsy, there goes our barbecue."

To summarize further, the essence of a safe plant rests on these foundations: A firm top-management policy, preferably written. A complete system of training all the way down the line, and continuing to allow for turnover and forgetting. The supervisory men are the key to safety—unless they believe and practice and preach . . . and unless they are forever watchful—no safety program can succeed.

And when they do . . . well, one speaker showed a 60% reduction in insurance premiums,—and that can be an index of all the other costs, visible and invisible, which safety can eliminate in a fertilizer plant or mine.

Now, because it is late and the printer is holding space open to get this story into our March issue, let us briefly run down the events of the two-day session in Atlanta.

It was opened by Vernon Gornto, Smith-Douglass, who is national vice-president of the Fertilizer Section, and program chairman for the Chicago meeting next October 22-23. He presented a panel of four, Moderator, A. B. Pettit, Davison Chemical—who did not learn until after that session of the sad death of his father in Canton, Oklahoma. The panel consisted of, reading from left to right: C. A. Cox, Virginia-Carolina; F. W. High, Baugh Chemical; E. F. Carnell, Davison; George F. Dietz, Fertilizer Manufacturing Cooperative.

MEETINGS AHEAD:

May 8, Roanoke
May 8, Baltimore
May 14-15 Winston-Salem
Oct. 22-23 Chicago
March 1-3, '54, Louisville

Questions enough to last two days had been sent in by the industry, and these were consolidated, boiled down—and finally just plain weeded out until they could fit into the afternoon session, and at that it ran thirty minutes overtime. Let's look at them:

How to sell safety to employees. Dietz: Convince them management really wants it. Show how accidents happen; selfish as well as economic reasons to put everybody on the team.

How to handle dynamite and caps. Carnell: Follow instructions on the box. Keep small quantities well separated, and only one shot at a time in the plant. Watch out for sparks, friction or electric. **What are the hidden costs of accidents?** High: Lost time, influence on others, later inefficiency etc. cost employer four time what insurance covers.

How to sell to top management. Cox: They like facts and figures; show public relations and personnel relations angles; show program pays for itself. **How much stress should be placed on off-the-job safety?** Dietz: Workers spend 8 hours in plant, 16 elsewhere—and accidents off-job are double on-job. Safety rules at home should be taught in schools, by law. Baltimore schools do this, including questionnaire parents must help children answer.

How to prevent accidents from slides. Carnell: These cause more deaths in our industry than any other cause. "Cliffs" are left overhanging. Bridge across and work down — blasting or otherwise — to make pile safe again. **Proper operating standards for self-propelled vehicles.** High: Service with gas and oil outside the plant. Check brakes etc. daily. Equip with fire extinguisher and check that often. Choose operators carefully, train fully—and permit only trained men to handle. Paint bright colors, use flashing lights, keep non-essential personnel out of path.

Entering tanks, other confined areas. Cox: Fill with water to expel gases, rope around man entering with attendant outside. Better send out of plant for cleaning when possible. Teach danger methods. Use explosion meters on the market.

Basic elements of effective safety program. Cox: Safety-minded management. Safety a job for someone. Regular safety meetings especially during rush periods. Good first aid equipment. Good safety equipment. Encourage ideas from personnel.

Safety Films: In the Q&A period the question was raised about safety films available. In our February issue we noted two films available from National Safety Council, both









1. The Panel in session: C. A. Cox, F. W. High, Vernon Gornto, A. B. Pettit, E. F. Cornell, G. F. Dietz. 2. Mike Ellison, new chairman. 3. Part of the group. 4. Close-up of panel: Top—Gornto, Cornell, Dietz; Front—Cox, High, Pettitt. 5. O. R. Kiphart 6. Walter Zielenske. 7. E. O. Burroughs, Jr. 8. A. C. Thornton. AMONG OTHERS PRESENT, not all in picture: **AAC**—O. F. Cordon, T. D. Conner, T. R. Crown, C. R. Lecroy, D. S. Parham, A. K. Wood. **Edgar Bros.**—W. E. Nixon, J. T. Etheridge. **Gulf Fertilizer**—R. G. Alford. **IM&C**—F. L. Butler O. A. Dixon, A. L. Foster, T. L. Holland, R. L. Hugg, Rucker McCarty, J. A. Reese, J. W. Rutland, Cameron Sinclair, Herbert Stanfill, A. Cliff Thornton, Albert A. Waugh. **Mathieson**—Hugh B. Holt. **Monsanto**—R. W. Fleming, Harry Delk, A. R. Sellers. **Naco**—C. J. Watts, Jr.—**Nitrogen Div.**—B. E. Adams. **Orkin**—W. B. Clark. **Phillips**—R. G. Diserens. **Royster**—E. O. Burroughs. **Sou. Fert.**—E. G. Mayfield, Virgil L. Purvis, W. L. Sprayberry. **Sou. States**—W. Rex Gabriel. **Superior**—Alfred D. Rothwell. **VC**—Frank Kurck, E. S. Shreffler, Wm. B. Yunase. **Weils**—W. D. Edwards, W. M. Robinson, **Swift & Co.**

designed to train foremen, and available also as slide-films. Write the Council at 425 North Michigan Ave., Chicago 1 for data and prices. **See Page 46, CF February for details.**

Dietz discussed **air controls:** Dust collectors, good scrubbing equipment prevent "neighbor trouble." Watch fluorides especially. Carnell talked on **special trouble spots:** Floor, acids, pipe-lines, tanks. Dietz discussed **man-training:** Pick good men, teach principles, break in new men with experienced men. Carnell on **portable power tools:** They look harmless, so need special training. Cox spoke on **channels for interchange of safety ideas.** Local group meetings; sectional, national—read the Safety News Letter.

Maintenance safety. Carnell: During shut-downs men trained in other work do maintenance. Special watchfulness and training needed. Salt safety trained men among maintenance crews. Oiler a good beginning because he knows all the equipment. **Gangboards.** Dietz: Buy aluminum or magnesium boards for lightness, or install lifting device to move heavy steel. Anchor securely. Have good side-rails, and traction surface. **Value of Safety contests.** Cox: Powerful impetus to competitive spirit in plants and between plants. **Electrical hazards.** Dietz: Motors overheat. Lock remote controls when motors, other equipment, being worked on. Professional, never amateur wiring, other installations. Watch fuse sizes.

Labor's part in safety. Carnell told the Lawsy, there goes our barbecue story. Program won't work unless labor works it. **Screw conveyors.** High: Enclose entirely if possible. Grating over peepholes.

Tuesday was devoted to four speakers: O. R. Kiphart, Phillips Chemical on **The Maintenance Foreman's Responsibility.** His plant has reached three million man hours without lost-time accident. Men value health but hate goggles etc. Up to us to make them use, make them think before acting, in and out of plant. Instil habit-forming thoughts. Foreman important because men are different from each other, and from themselves under various conditions. Wise foreman knows men intimately, acts accordingly. When safety changes are introduced, discuss with foreman first,

(Continued on page 84)

MARKETS

Fertilizer Tag Sales Hit Record

Domestic fertilizer consumption in 1952 may reach 20 million tons—7% above the 18.7 million tons used during 1951, according to The National Fertilizer Association. This conclusion is based on the fact that sales of fertilizer tax tags and reports of shipments in 14 reporting states for the past 12 months amounted to more than 10.5 million tons, 7.2% above the 9.8 million tons recorded in 1951. Fertilizer consumption in the reporting states traditionally has been over 50% of total U. S. fertilizer consumption.

January Tag Sales Off

Fertilizer tax tag sales and reports of shipments were equivalent to 661,000 short tons of fertilizer in January this year. According to a compilation of reports made by The National Fertilizer Association, this is a drop of 56,000 tons below the 719,000 tons reported for the same month a year ago.

Last quarter, 1952, sales and reports of shipments were 1,962,000 equivalent short tons, 160,000 tons below fourth quarter, 1951, tax tag sales and shipment reports totaling 2,142,000 tons.

ORGANICS: No change in the Organic market as supplies are still limited at prices of Nitrogenous ranging from $4.55 to $5.00 per unit of Ammonia, bulk f.o.b. shipping point.

CASTOR POMACE: Limited supply of domestic at $37.50 per ton in burlap bags, paper bags, seller's option, f.o.b. Northeastern production point with $2.00 per ton allowance if shipment is made in paper bags.

DRIED BLOOD: Market quiet on account of lack of feed demand at around $6.00, bulk, f.o.b. Chicago.

POTASH: The movement has picked up and domestic producers are being pushed to make delivery on account of the delayed season.

GROUND COTTON BUR ASH: Primarily in the form of Carbonate of Potash, is available for prompt and future shipment at prices near the delivered price of Domestic Sulphate of Potash for which the demand is quite keen as supplies of Sulphate of Potash are not plentiful.

PHOSPHATE ROCK: Market firm and high-grade rock, particularly, tight.

SUPERPHOSPHATE: This is somewhat easier at the moment but with the increased demand for mixed goods now prevailing, the situation could tighten up quickly.

SULPHATE OF AMMONIA: Demand strong with supplies of foreign material available being rapidly depleted.

AMMONIUM NITRATE: This market is extremely tight and supplies are not adequate for the demand.

NITRATE OF SODA: Importers are apparently taking care of the demand on Chilean and sales of imported Calcium Ammonia Nitrate are cutting into the sale of Chilean.

CALCIUM AMMONIUM NITRATE: Testing 20 to 21% Nitrogen is in keen demand. Recently the available nearby supplies have been cut down as one importer has been forced to notify his buyers that a foreign Goverment had cancelled all his contracts due to the demand in that country. Where obtainable, prices remain $51.25 per ton f.o.b. cars at the dock.

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS
(In Thousands of Equivalent Short Tons)
Compiled by The National Fertilizer Association

STATE	December 1952	December 1951	November 1952	November 1951	Jan.-Nov. 1952	Jan.-Nov. 1951	July-Aug.-Sep. 1952	July-Aug.-Sep. 1951	July-November 1952-53	July-November 1951-52
Virginia	—	—	—	—	—	—	90	91	—	—
N. Carolina	—	—	39	55	1,803	1,687	91	94	219	240
S. Carolina	56	57	42	65	916	881	84	71	173	202
Georgia	75	74	80	59	1,318	1,196	69	53	216	178
Florida	163	97	153	161	1,125	1,108	201	152	459	453
Alabama	—	—	32	48	1,083	1,039	131	82	209	176
Tennessee	8	8	32	36	582	591	67	73	132	200
Arkansas	10	13	11	13	355	402	35	22	61	51
Louisiana	14	8	19	12	322	294	38	29	81	60
Texas	27	35	29	43	555	532	95	79	176	186
Oklahoma	—	—	2	7	178	147	57	38	68	59
TOTAL SOUTH	353	292	439	499	8,237	7,877	958	784	1,794	1,805
Indiana	138	69	116	179	950	866	250	197	397	415
Missouri	91	58	17	34	779	679	251	167	305	232
TOTAL MIDWEST	229	127	133	213	1,729	1,545	501	364	702	647
California	—	—	—	—	—	—	150	137	—	—
TOTAL OTHER	—	—	—	—	—	—	150	137	—	—
GRAND TOTAL	582	419	572	712	9,966	9,422	1,609	1,285	2,496	2,452

STATE	January 1953	January 1952	December 1952	December 1951	Jan.-Dec. 1952	Jan.-Dec. 1951	Oct.-Nov.-Dec. 1952	Oct.-Nov.-Dec. 1951	July-December 1952-53	July-December 1953-52
Virginia	—	—	—	—	—	—	—	—	—	—
N. Carolina	—	—	69	77	1,871	1,764	197	223	287	317
S. Carolina	121	129	56	57	971	939	145	189	229	259
Georgia	82	82	75	74	1,393	1,271	222	200	292	252
Florida	153	162	163	97	1,200	1,205	421	398	622	550
Alabama	—	—	30	52	1,113	1,091	108	145	238	227
Tennessee	2	20	0	0	590	599	74	134	140	207
Arkansas	17	18	10	13	366	415	37	42	72	64
Louisiana	24	29	14	8	336	308	57	38	95	68
Texas	39	58	27	35	582	568	100	143	203	222
Oklahoma	—	—	4	5	182	152	15	26	72	64
TOTAL SOUTH	438	498	456	426	8,692	8,307	1,384	1,538	2,250	2,330
Indiana	165	155	138	69	1,089	935	285	287	535	483
Missouri	58	66	91	53	871	738	145	123	397	291
TOTAL MIDWEST	223	221	229	127	1,960	1,673	480	410	932	774
California	—	—	—	—	751	775	160	194	318	331
TOTAL OTHER	—	—	—	—	751	775	168	194	318	331
GRAND TOTAL	661	719	605	553	11,403	10,755	1,982	2,142	3,500	3,335

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Dry Application:

Use Nacconol NR Flake or Dense Beads—the free flowing, non dusting types that disperse beautifully and uniformly. Add the required amount at the weighing hoppers or pre-mix with potash or other dry materials being used in the mixture. It is important that the Nacconol be distributed throughout the mix as thoroughly as possible.

Wet Application:

Use Nacconol NR Flakes or Nacconol Z Flakes—both readily dissolved in tap water. Where conditions permit, the required amount of either type of Nacconol may be dissolved and added directly to the mixer.

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NAC MEETING IN NEW ORLEANS

The Pesticide producers of the nation are in session as you read this, facing two facts: 1. They are vital to the nation. 2. This looks like a tough year for them, because of drought and high carry-over inventories. And with that in mind, read their program:

How to cut down on the 13 billion dollar annual loss to agriculture from insects, disease and weeds by use of chemicals will be discussed by members of the National Agricutural Chemicals Association at The Jung Hotel, New Orleans, Louisiana, March 11-13.

According to Lea S. Hitchner, the Association has asked authorities from agriculture and industry to discuss problems of pest control and ways that can be employed in cutting down losses.

The first day's session, March 11, will be presided over by Paul Mayfield, NCA vice president and manager of the Naval stores department, Hercules Powder Company, Wilmington, Delaware. Arthur W. Mohr, NAC president, and president of California-Spray Chemical Corporation, Richmond, California will begin the three-day meeting with an address summarizing conditions in the industry. A report on NAC activities will be made by the executive secretary.

Avery S. Hoyt, Chief of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, is expected to present some information regarding impor-- ant economic insect pest problems in the United States and the status of control operations. Dr. A. F. Camp, vice-director in charge of the Florida Experiment Station will discuss the minor elements and nutritional sprays and their use in agriculture. Dr. Warren C. Shaw of the Bureau of Plant Industry, Soils and Agricultural Engineering, United States Department of Agriculture, will point out some recent advances in weed control.

Closing the first day's session Senator Allen J. Ellender who is a member of the Senate standing committee on Agriculture and Forestry, is expected to fly in from Washington, D. C. to advise members of the pesticides industry as to what agricultural chemicals have meant to southern agriculture.

According to Hitchner, Thursday, March 12, will be devoted entirely to committee meetings and other association business with a dinner in the evening.

On Friday, March 13, NAC Association members will hear a discussion of pending legislation, both state and federal, by Joseph A. Noone, NAC technical adviser, and an address on Systemic Insecticides by Dr. H. G. Johnston of the National Cotton Council, Memphis, Tennessee.

The remainder of the morning program on Friday will be given over to technical and philosophical discussions on various phases of chemicals in agriculture. Forest and lumber insects will be discussed by R. Joseph Kowal and H. R. Johnston of the Bureau of Entomology and Plant Quarantine, USDA, Gulfport, Mississippi. Dr. Charles E. Palm of Cornell University, Ithaca, New York, who recently returned from a tour of European countries, will advise the NAC members about foreign pesticide developments.

"The Future of Agricultural Chemicals In The South" will be discussed by Dr. Eugene Butler, Vice President and Editor of **The Progressive Farmer,** Dallas, Texas.

Closing the three-day meet, John D. Conner, NAC Counsel, will advise the association members concerning the implications of improper use of their products.

Ewing To Head USDA's Cotton Insects Division

K. P. Ewing, entomologist of the U. S. Department of Agriculture, has been named, effective February 15, to head the Division of Insects Affecting Cotton and other Fiber Plants. He succeeds R. W. Harned, long a leader in cotton insect research, who has headed this Division since 1931 and who is continuing with the Bureau of Entomology and Plant Quarantine as both staff assistant to the chief and as a consultant, particularly in respect to cotton insects and their control.

3 Hércules Color Films Demonstrate Pest Control

Three new 16 mm. films in sound and full color have been released by Hercules Powder Company, producers of toxaphene, to help growers of seed, cereal, and forage crops increase yields through proper insect pest control.

The longest of the new films is "The Pollination of Alfalfa," a movie which runs about 25 minutes, highlights unusual closeup views of bees visiting the blossoms, shows the pollination process.

"The Spittlebug and Its Control," is about 14 minutes in length. Action shots of spraying and dusting equipment, and interviews with farmers, county agents, and extension entomologists show just how this destructive insect is controlled.

The third film, "The Alfalfa Weevil and Its Control," shows the life cycle of the weevil so farmers will be better prepared to fight this insect pest.

All of these movies are now being distributed to state extension services where they will be used at farm meetings throughout the states. Copies are also available for short term loan from Hercules

(Continued on page 55)

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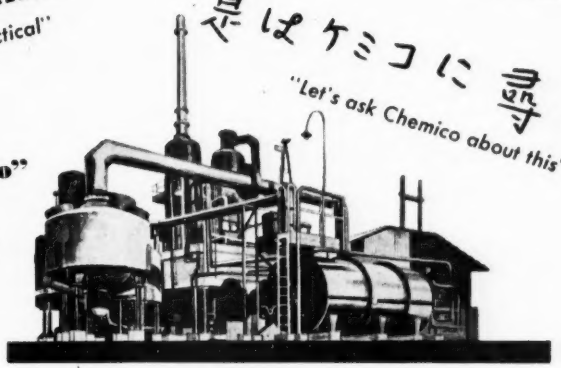

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ALABAMA

A. A. Liquid Fertilizer Co., Troy, has been organized by **H. R. Theriott, R. B. Blumentritt, W. F. Joiner and T. W. James** and will be incorporated shortly. It will serve an area heretofore without anhydrous ammonia application facilities.

ARKANSAS

Stuttgart Ammonia Distributors, Inc., Stuttgart, has been incorporated by **Virginia Hazelbaker, Vera Meehan, A. G. Meehan** and **W. O. Hazelbaker, Jr.** with 100 shares at $100 par as initial capital.

* * *

White River Spraying & Dusting, Inc., DeWitt, has been organized with capital of $50,000 by **Q. D. LaFarque, Jr., Rosellen LeFargue,** and **Q. D. LaFarque, Sr.**

CALIFORNIA

Union Oil Company's recently organized subsidiary, **Brea Chemicals, Inc.** will operate the $13,000,000 plant at Brea which will make ammonia from the nearby gas wells. Operation is scheduled for summer of 1954.

* * *

Carnegie Chemical Mfg. Co., Los Angeles, one of the oldest and largest of its type on the West Coast has been incorporated as the **Carnegie Chemical Manufacturing Corp. Irwin Cornell** is president.

* * *

Globe Fertilizer Division of the Kellogg Supply Company has been opened by H. Clay Kellogg at 4139 Bandini Blvd., Los Angeles, after his purchase of the assets of the former **Globe Fertilizer Company.** Most of the employees of the old concern are now with the new division. **Fred Little,** former Globe president, and his son, **Willard,** are now salesmen for the division, which specializes in the nursery trade.

FLORIDA

Davison Chemical is expecting early 1954 operation of the $12,410,000 plant for production of triple superphosphate which the corporation is constructing at Bartow. It will have an annual capacity of 200,000 tons of the agricultural chemical and according to a recent survey by the Florida Development Commission is the largest among $35,000,000 in construction projects which the phosphate rock industry now has under way.

The plant will mark Davison's entry into triple superphosphate production and establish the company as a major producer of the chemical. Total capacity in the industry is estimated currently at 770,000 tons annually. By 1954 Davison's output added to other new and expanded operations will bring the industry's total estimated capacity to more than 1,000,000 tons annually. However, demand by the end of that year is expected to reach 1,600,000 tons, based on forecasts by the United States Department of Agriculture.

Production of sulphuric acid will also be started in Florida in connection with the triple superphosphate plant **The Dorr Company,** Stamford, Conn. are architect engineers and this will be the first triple superphosphate plant in the United States employing the patented Dorr process. Sulphuric acid is reacted with phosphate rock to produce phosphoric acid, which in turn is applied to additional phosphate rock for triple superphosphate production. The final product will be in both granulated and pulverized forms.

GEORGIA

Tennessee Corp. will build a $750,000 manganese ore reduction plant near their present fertilizer plant at East Point.

* * *

Cotton Producer's Association has built a $300,000 "push-button" plant at Carrollton, to replace the one recently destroyed by fire.

IDAHO

Simplot Fertilizer Company, Pocatello, will henceforth be known as **Fertilizer Division** of **J. R. Simplot Company,** according to word from the concern.

* * *

Gates Brothers, Inc., Wendell, and **Jefferson Lake Sulphur,** New Orleans, will construct a 70,000 annual ton treble superphosphate plant at a location not yet determined. The announcement was released by **George F. Wilkins,** general manager of the Gates phosphate plant at Wendell.

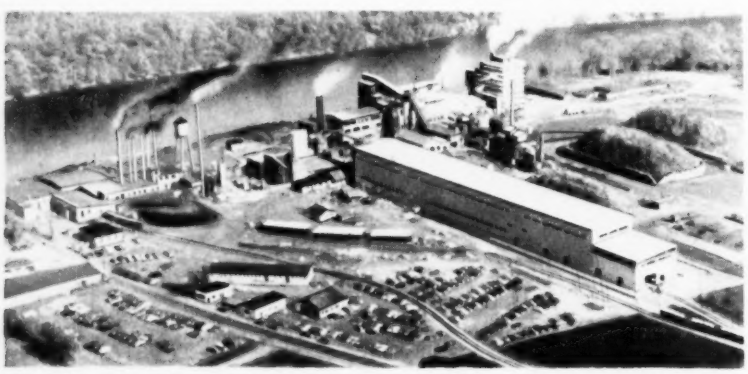
ILLINOIS

E. Rauh & Sons Fertilizer Co. of Indianapolis, are considering construction of a $2,000,000 fertilizer plant near Tuscola. A certificate of necessity has been issued permitting 5-year write-off of 75% of the $1,928,500 estimated cost of construction. If built, the plant will use products of the **National Petro-Chemicals** $40,000,000 gas-processing plant, and will be located on a corner of the Petro site. The Petro plant is to be in operation this Summer.

* * *

Do-Well Agricultural Service, Champaign, reports that the fifty farms managed by them returned $2 for every $1 invested in 1952.

This crop booster program, featuring the use of blended fertilizers, is



Aerial view of the Roanoke Rapids mill of Albemarle Paper. The long building in the center houses the new giant Beloit paper machine.

Around the Map

used in addition to long established basic treatment based on soil tests. That it was profitable last year is verified by 53 yield checks, even though the season was not too favorable for a fertilizer response.

"Soil tests and the application of limestone, rock phosphate, and potash always are considered basic," says **Roger Gish,** agronomist with the Do-Well Agricultural Service. "Use of legumes and livestock also is a part of the basic treatment in the main program.

"In addition, we have been using some commercial fertilizer for several years. This program moved into full swing last year."

About two years ago, **E. H. Tyner,** professor of soil fertility at the **University of Illinois,** was asked for a specific program which could be used on farms where basic soil treatment with limestone, rock phosphate, and legumes already had been made, Gish says.

Tyner suggested, with variations on different farms and different fields, the use of 50-20-20 on second year corn and 20-20-20 on first year corn and small grain.

Plant food removed by medium to heavy yields in an ordinary rotation will show that this program still is minus balance insofar as replacement of plant food is concerned, so that limestone and rock phosphate has been replaced periodically according to soil tests.

"Plant food for the crop may be applied in mixed fertilizers or straight materials," Gish points out. "We use a combination or blend of both through necessity. For example, 10-10-10 is not always available and is expensive when it can be bought."

Program calls for tissue tests to be made on growing corn plants in each field each year to check on the proper balance of available plant nutrients.

Although this system of fertilization has been in full effect only one year, it was tried on about 50 farms in five counties. Highest yield reported was 120 bushels from a field of first year corn in McLean County, where 160 pounds of 3-12-12 and 100 pounds of 21-0-0 were used.

Average yield of corn for Champaign County in 1951 was 59 bushels. Eighteen farms managed by Do-Well in the county averaged 75.9 bushels.

Final report for 1952 for the county probably will be about 59 bushels or possibly a little less, Gish says. Thirteen other farms with Do-Well service for the first time this year averaged 68.3 bushels.

"Eighteen farms managed more than one year, now using the new fertilizer program in conjunction with the old proven system of limestone, rock phosphate, and legumes, averaged 73.2 and the overall county average for the 31 farms was 71.6 bushels."

New fertilizer program has been referred to as a "Booster Fertilizer," "Supplementary Fertilizer," "Illinois System, Plus," and by other names, some giving Do-Well credit and attaching the firm name to the system.

"Actually, it came straight from the university with approval of various members of the agronomy department and might be called 'The Illinois Balanced Soil Fertility Program'," Gish explains.

KANSAS

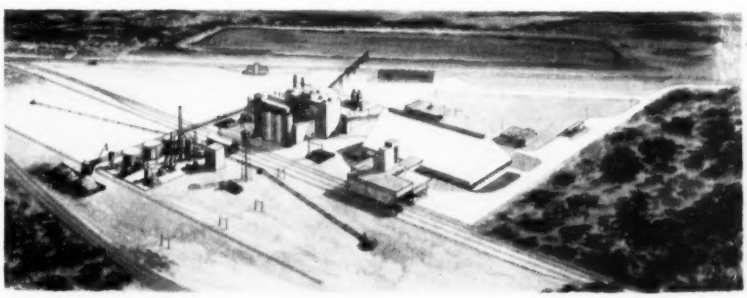
Consumers Cooperative $15,000,000 plant near Lawrence, started in December and reported here in our January issue, had a cornerstone laying. We were curious what went into the cornerstone. It contained a microfilm list of the 9,000 farmers and others whose investment launched the project. The cornerstone itself is supposed to be opened in 1977.

LOUISIANA

Commercial Solvents has awarded a contract to **Luria Engineering** for the 16,000 square foot plant to be built in Sterlington. It will be a one-story building of standardized steel frame, with corrugated aluminum cover. 200 feet long, the structure will have a clear span of 80 feet for column-free floor space. It will be 20 feet to the eaves. The building, which will produce ammonium nitrate when machinery is installed, is due to be ready this month.

* * *

Freeport Sulphur which, as has been reported here, has been conducting extensive exploratory drilling since last April on the dome known as Chacahoula, 69 miles west



Artists rendering of the Davison Chemical plant now under construction at Bartow, Florida—their first entry into the production of triple superphosphate. It is scheduled for early 1954 operation.

of New Orleans, have decided to develop the mine—their fourth new sulphur project in two years. As is the case with the other operations, the new one will be by Frasch process.

* * *

Farmers Ammonia Company, Inc., Gilliam, has been incorporated with 6,600 shares of no par value.

MINNESOTA

Midland Cooperative Wholesale has bought a $220,000 interest in **Central Farmers Fertilizer Co.,** which is owned by several regional supply cooperatives similar to Midland, whose purchase represents about 9% of the CFF stock.

MISSISSIPPI

Geigy Company has just completed a one-story steel frame structure 100 feet long by 16 feet high, with three clear-span bays of 40 feet each. **Luria Engineering** standard fabrications were used.

* * *

Silver City Fertilizer Company, Inc., Silver City, has been chartered with capital stock of $6,000.

MISSOURI

St. Joseph Fertilizer Co., St. Joseph, began operations February 13 with the arrival of its first shipment of anhydrous ammonia. Stockholders are **Walter S. Andrews, J. Lyman Andrews, Ernest D. Alldredge** and **Robert E. Madget.** They have five 6,000 gallon tanks.

NEBRASKA

Falls City Fertilizer, Inc., is a new maker of complete fertilizer, at Falls City. Officers are **Howard L. Peterson,** president; **B. F. Backlund,** vice-president; **Gilles L. Downey,** secretary-treasurer. They plan to be in production by May 15, Mr Peterson writes.

NEW JERSEY

Diamond Alkali, Cleveland, in its report to stockholders mentioned the 1952 beginning of operations of the new miticed plant at Newark. (See Texas)

NEW YORK

American Agricultural Chemical was awarded a certificate of management excellence by the **American Institute of Management,** one of only 330 out of the 3,000 leading concerns studied found eligible for the destinction. (See Canada)

* * *

National Gypsum, Buffalo, will soon build a $1,000,000 research center in Tonawanda—a 48,000 square foot structure of brick and concrete, two stories, of modern design. It will include space for pilot plants of their various gypsum product development projects, and will be ready in the Fall.

NORTH CAROLINA

Fairmont Fertilizer, Lumberton, bought by **Jim Hunter** last August from **P. R. Floyd,** who had operated it on a limited scale, has been enlarged and modernized for a 4,000-ton production this year. Mr. Hunter's company is the **Master Fertilizer Corporation.** He was formerly a salesman for **Armour.**

* * *

Albemarle Paper announces that with the opening of its new mill at Roanoke Rapids, it has greatly increased the facilities of its completely integrated operation for the manufacture of Multiwall Bags.

Lacking only eight and one-third yards of being as long as a football gridiron, a huge new Beloit Paper Machine is now rolling out 250 tons of Kraft paper daily, and assures an ample supply of kraft for the company's expanding multiwall business.

Latest development in a modernization program that started in 1946, this new Fourdrinier machine, installed at a cost of $5 million is capable of turning out 270 tons of kraft paper daily at maximum capacity. At present 250 tons of kraft for multiwall bag manufacture and for wrapping and converting kraft are being produced each day from this new equipment.

S. D. Fleet, vice-president and sales manager of Albemarle points out that this is the newest, most

6 NEW PLANTS NOW UNDER CONSTRUCTION

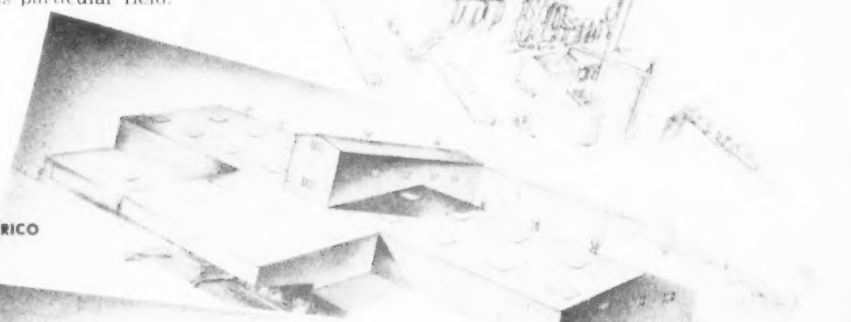
These brilliant performers of advanced Sackett design will, upon completion, have a combined annual production capacity of well over 300,000 tons.

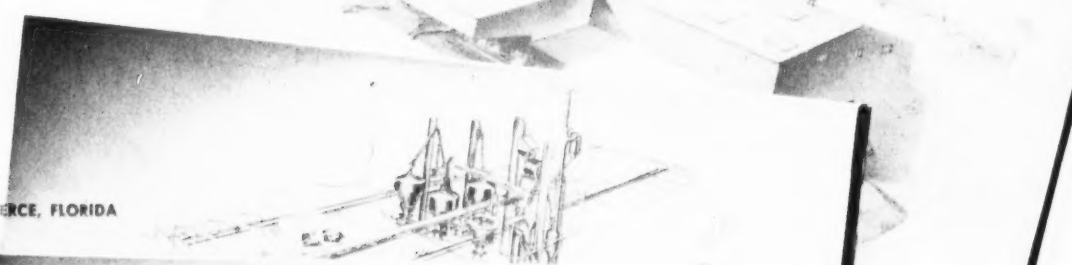
Each of these highly mechanized new manufacturing facilities adds further tangible proof to our long-recognized leadership in this particular field.

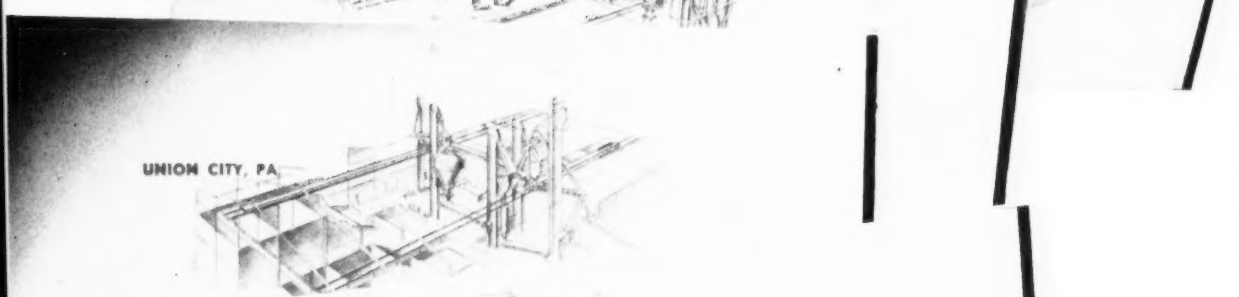
Superphosphate and mixed goods producers are invited to get our seasoned counsel on their expansion and modernization programs. It is available at no cost.


COLUMBIA CITY, INDIANA

SHEFFIELD, ALABAMA


PUERTO RICO


FORT PIERCE, FLORIDA


UNION CITY, PA.


PERU, INDIANA

SACKETT
BALTIMORE

America's Foremost Designers and Builders

SUPERPHOSPHATE PLANTS · FERTILIZER MIXING PLANTS · RELATED PRODUCTION EQUIPMENT

THE A. J. SACKETT & SONS CO., 1727 S. HIGHLAND AVENUE, BALTIMORE 24, MD.

Architects and Manufacturing Engineers to the Fertilizer Industry since 1897

modern and probably one of the finest paper making machines in the world today.

OKLAHOMA

John Deere Co.'s plant at Pryor will be in full construction by April 1, according to **W. W. Yeandle,** works manager of the Grand River Chemical division.

PENNSYLVANIA

Reading Bone Fertilizer Co., Reading, is distributing a card from which the attached is reprinted. Bob Engle of NFA told us about this during the Georgia Plant Food Educational Society meeting in Athens recently, and we asked him to send us a copy because we felt it would do the industry a lot of good, these troubled days, to read it:

ERUNAM for the asking . . .

"Public demand forces us to release our revolutionary new garden product, ERUNAM, (pronounced AIR-OO-NAM). ERUNAM is not just an inert soil conditioner. ERUNAM is not only a miracle type plant food. ERUNAM is everything! One heaping glob of our magic atomic substance will remake your garden. ERUNAM makes light soils heavy, heavy soils light and stedfastly ignores the medium soils. ERUNAM is a selective pesticide; it kills harmful weeds, bugs and diseases while fraternizing with the approved ones. Better yet, ERUNAM has the Good Wormkeeping Seal of approval. ERUNAM contains decomposed chlorophyll; your garden will never smell the same. ERUNAM contains no nasty chemicals; it's purely organic. One pound of this concentrated product is equivalent to 16 ounces. Most of the world's leading barnyards are full of ERUNAM.

"Write for our trial garden size bucket today. We have a limited quantity on hand.

"Remember ERUNAM spelled backwards is . . ."

READING BONE FERTILIZER CO.
Reading, Pa.

SOUTH CAROLINA

Charleston's fertilizer people are disturbed over the threat of the Army to recapture the 100-foot Cooper River pier, which is used for large quantities of fertilizer materials. Hopes are that if the Army Transportation Corps does exercise its recapture rights, arrangements for joint use can be worked out.

TENNESSEE

Shea Chemical, Baltimore, has announced its new elemental phosphorus furnace at Columbia is in full operation. This has a capacity of forty million pounds of white phosphorus, and is a 30,000 KW unit. Shea is completing a $3,500,000 development program at Columbia all in the phosphate field.

* * *

Werthan Bag is constructing an addition to its present plant in Nashville, which will go into production of multiwall bags when completed late this year.

* * *

Tennessee Products & Chemical is completing a $2,500,000 expansion of facilities at Chattanooga, which includes a plant for pesticides, and trichlorobenzene.

TEXAS

Diamond Alkali, Cleveland mentioned in its annual report to stockholders the opening during 1952 of the new Lindane plant at Houston. (See New Jersey)

* * *

Gulf Alkali of New York and Houston is planning a $6,000,000 plant on 148 acres it has already purchased on Cedar Bayou, near Baytown, a salt brine plant at Mount Belvue where the concern has 54 acres over a salt dome, and a distribution plant in Houston. **Thomas D. Jenkins** is president; **G. D. Thiel,** vice-president, **Douglas McGregor** is secretary-treasurer. For about 25 years Mr. Thiel has headed the **Red Circle** pesticide operation.

* * *

Standard Sulphur plans a $450,000 mobile sulphur plant to recover sulphur by the Frasch process from mounds formerly mined by **Texas Gulf Sulphur** and **Freeport Sulphur.** They will lease Damon Mound from **Texas Exploration Co.** on a royalty basis, and expect to be in operation by June.

* * *

Red Star Fertilizer, Sulphur Springs, are remodeling their office building to provide two additional rooms.

* * *

International Paper are establishing a consolidated sales office to serve the Southwest in Dallas, it was announced by International Paper Company on February 2nd, by **Richard C. Doane,** vice president and general sales manager.

The new office is located in the recently completed Fidelity Union Life Building, 1511 Bryan Street, Dallas (1), Texas. **J. W. Dennett,** formerly of the Chicago office, will represent Southern Kraft Paper and Bags, **H. T. Patton,** will be in charge of Texas sales for the Bagpak Division.

UTAH

Western Phosphates is making rapid progress with its plant at Garfield. Vice-president **John Paul Jones** expects it now to be in production by November. Elaborate precautions are being taken to prevent "neighbor trouble" from fumes.

AUSTRIA

Fertilizer production was 30,965 metric tons of ammonium nitrate, 3,905 tons of ammonium sulfate in October 1952, the most recent figures available. Of this exports to Egypt and Portugal totalled 4,495 tons that month.

CANADA

Consolidated Mining & Smelting, Montreal, has been awarded a certificate of excellence by the American Institute of Management, one of only 330 companies of 3,000 studied found eligible to receive the designation. (See New York)

* * *

Canadian technicians being sent to Mexico to study the operations of **Guanos y Fertilizantes de Mexico** is not as surprising to readers of this department as to the press which naively reported that **Chemico** is

sending a delegation there to see first hand the methods to be adapted later in the operations of an Ottowa plant. Mexico's very enlightened agricultural program is worthy of any nation's study, and the technical phases of its fertilizer production are due largely to American engineering . . . in which, if memory serves us, Chemico itself has played a big part.

COLOMBIA

A 20 million peso concern to manufacture fertilizers will locate at Barranca Bermeja where the Government petroleum concession is situated so that natural gas may be used as raw material. The principal owners are: **National Institute of Industrial Development, Caja de Credito Agrario, Industrial y Minero, the Colombian Petrolium Co.** and the **National Federation of Coffee Growers** of Colombia.

FINLAND

The three sulphuric plants, at Harjavalta, Lappeenaranta and Kokkola, the latter of which was expanded 50%, produced 130,000 tons in 1952, as compared with 116,000 in 1951. A new ammonium sulfate plant went into production in Kokkola in September and is producing at an annual rate of 15,000 tons.

INDIA

Beginning next year, two new fertilizer plants will be constructed at Sindri, with American aid. A urea and ammonium nitrate plant that will cost $9,000,000; a methanol plant which is already owned, from German materials.

ISRAEL

Elath, Sodom and Beersheva may well become the heart of a sulphuric operation, since 90% pure plaster gypsum deposits have been found there.

VENEZUELA

Manufacturas de Algodon, Maracay, is building an 800,00 bolivares plant to produce sulphuric and its derivatives, with an estimated 15 daily metric tons. It should be in production within the next few months.

General American Revised Steam Dryer Bulletin

Bulletin #53 covering the Louisville Steam Tube Dryer produced by the Louisville Drying Machinery Unit of General American Transportation Corporation may be had by writing them at 135 South LaSalle Street, Chicago 90, or by application to any of the branch offices in principal cities. It is an unusual bulletin in many respects, giving the whole story, fully illustrated, of the steam tube dryer, its various constructions, sizes, and a list of uses showing organic and inorganic applications. The final page is removable, and consists of a questionnaire, easily filled out so as to give the Louisville engineers data needed on which to report to you the type of dryer which will fit your needs. The questionnaire includes in addition to obvious questions, a great many others which should be the basis for study by the plant engineers in their choice of dryer type for a given application.

2 New Link-Belt Bulletins Published

Link-Belt Company, 307 N. Michigan Avenue, Chicago 1, have just published two bulletins of special interest to the fertilizer industry: Book No. 2289 is a 92 page comprehensive report on screw conveyors and screw feeders. Book No. 2519, a 36-page book on herringbone gear drives. Both will be sent to interested readers on request.

This fork truck is transporting something new—non-skid multiwall bags, by Union Bag & Paper. A special coating applied to the face and back during manufacture gives high skid-resistance. On a sharp sudden stop, the bags just leaned slightly and settled back, instead of sliding off as so often happens. The formula is the product of long research by Union's sales development people.

Pesticides

(Continued from page 48)

Powder Company representatives located in Wilmington or any of the company's branch offices.

Cotton Pest Meet Phoenix, April 9

How cotton growers in Western areas can increase efficiency of insect control and defoliation will be outlined at a meeting in Phoenix, Arizona April 9 when the Western Cotton Insect Control and Defoliation Conference will be held at the Westward Ho Hotel. Invited to attend are growers and others from the El Paso area of Texas, New Mexico, Arizona, California and Nevada.

YOUR ENTERING WEDGE FOR NEW MARKETS

FULTON TIME-TESTED COTTON BAGS for FERTILIZER

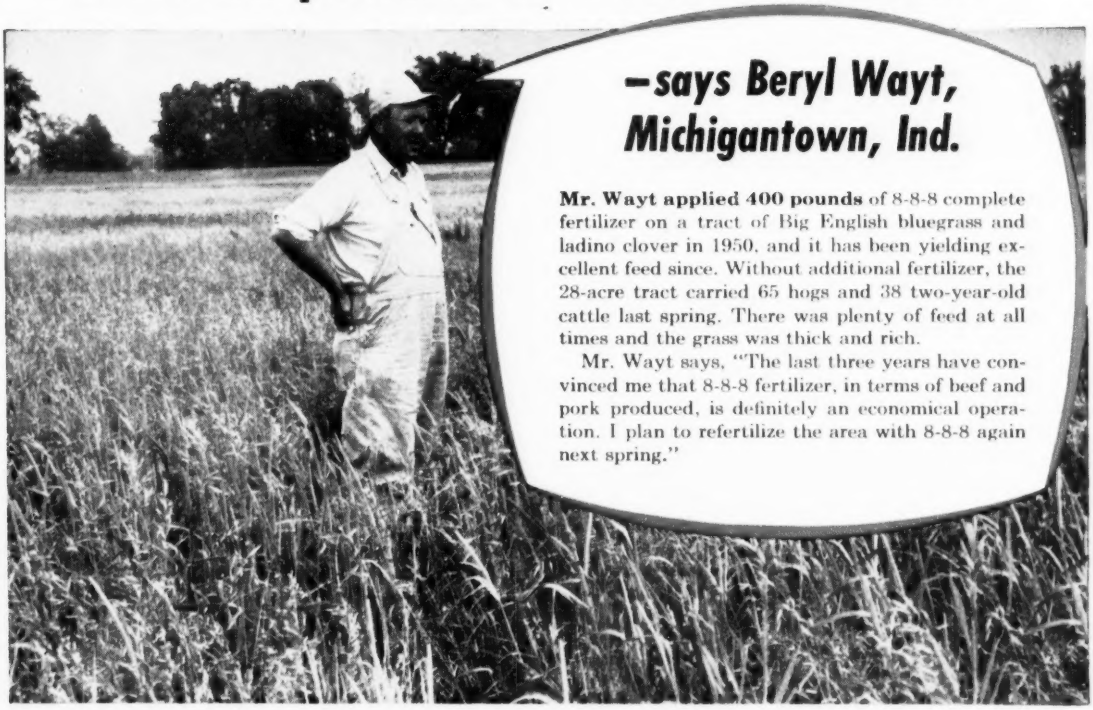
Fulton's 36" 3.60 yard sheeting — makes a 100 lb. fertilizer bag that has given universal satisfaction from the time it was introduced by Fulton a few years ago.

Extra value appeal of cotton bags to farm women is unquestioned. Actual worth of the sewing material she reclaims from cotton bags (about 21½ yards per ton) far outweighs the small additional costs over bags that positively have NO re-use value. Extensive publicity in national magazines, radio and television, and consistent advertising in farm publications, has kept interest in sewing with cottog bags at high pitch.

Give your fertilizer sales appeal far beyond the analysis tag. Lift your brand above the common herd. Win new markets and build up your old ones with Fulton's attractive, useful and high quality cotton bags. It's not too late. Call your nearest Fulton branch now and get the benefit of sales building cotton bags for your fertilizer this season. Why not call now?

Fulton BAG & COTTON MILLS Atlanta · New Orleans · Dallas · St. Louis · Denver
Los Angeles · Kansas City, Kans. · Minneapolis · New York City, 347 Madison Ave. · Winter Haven, Fla · San Francisco · Phoenix

"In terms of beef and pork produced, 8-8-8 on pastures is a real investment"



—says Beryl Wayt, Michigantown, Ind.

Mr. Wayt applied 400 pounds of 8-8-8 complete fertilizer on a tract of Big English bluegrass and ladino clover in 1950, and it has been yielding excellent feed since. Without additional fertilizer, the 28-acre tract carried 65 hogs and 38 two-year-old cattle last spring. There was plenty of feed at all times and the grass was thick and rich.

Mr. Wayt says, "The last three years have convinced me that 8-8-8 fertilizer, in terms of beef and pork produced, is definitely an economical operation. I plan to refertilize the area with 8-8-8 again next spring."

Bigger yields for farmers mean better business for you

THE big yields that high-nitrogen fertilizers produce are the strongest argument in favor of their use. Farmers find they pay for themselves over and over again.

Results like this are pushing the demand for high-nitrogen complete fertilizers up and up. Meet this demand by giving high-nitrogen fertilizers a big spot in your sales program.

And for the best results, use U·S·S Ammonium Sulphate for a major part of the nitrogen content. It's a dry, free-running material that performs well in mixing as well as in distributing equipment.

For complete information on U·S·S Ammonium Sulphate, get in touch with our nearest Coal Chemical sales office or write directly to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

U·S·S AMMONIUM SULPHATE

USS

3-447

UNITED STATES STEEL

Electrical Equipment
FOR PHOSPHORUS FURNACES

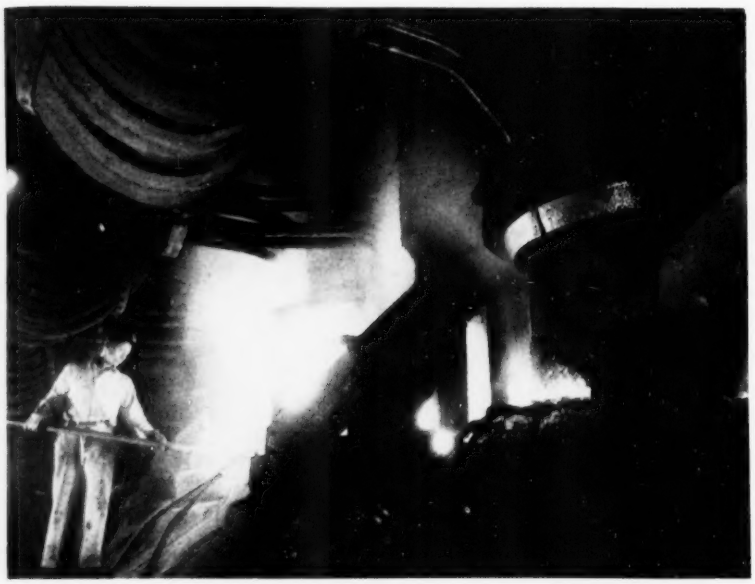
By E. H. Browning

The production of elemental phosphorus is presently carried on through the use of three processes. One of these is the wet process, in which phosphate rock is treated with sulphuric acid, a second is by use of a fuel-fired blast furnace, and the third is by the electric furnace process.

The electric-furnace process is not new in the sense of its possiblities being known. In 1889 a small furnace was operated in England and small single-phase furnaces were installed to use the newly developed Niagara Falls Power in 1896. However, the development of the electric-furnace process was to wait for some 30 years before arc furnaces were used extensively for the production of phosphorus and phosphoric acid. Some slight commercial activity employing the electric furnace was undertaken in 1920, but even as late as 1935, the economic aspects of this form of production had not been established to the point which made it attractive. Since 1935, however, some further investigating work was done—in part by TVA—and within the last 10 or 15 years the electric furnace has established itself in the phosphorus producing industry as a prime tool.

The electric furnace can produce phosphorus of high (food-grade) purity from low-grade siliceous phosphate rock. This has been an important cause of the recent rapid development of the electric-furnace method.

The electric furnace used for phosphorus production is not as spectacular in its operation as is the well-known steel-melting or metal-melting furnace. This is primarily because the phosphorus furnace must be sealed from the air, hence prohibiting the demonstration of smoke and colored flames that characterize most arc furnaces.



An electric furnace used by TVA for the production of elemental phosphorus, most of which goes into production of fertilizer.

In construction also the phosphorus and ferrous metal furnaces differ. The phosphorus-producing furnace is built up of a steel shell with a lining that is normally made up of large carbon blocks joined by a rammed carbon paste. Above the hearth proper, the lining is most often of a refractory brick. The furnace, being enclosed, has stuffing-box seals where the carbon or graphite electrodes enter through the roof. The modern phosphorus furnace is three phase. The three electrodes usually are located in a straight line along the length of the ovalshaped furnace, although furnaces developed by TVA and used by at least one independent company have triangular spaced electrodes. These movable electrodes, under the conditions of normal operation, are buried in intimate contact with the charge, hence placing the furnace in a submerged-arc and resistance category.

The charge or burden—a mixture of phosphate rock, coke, and a siliceous flux—is fed into the furnace continuously through hoppers and chutes, located near the furnace electrodes. A take-off duct is provided in the roof through which the carbon monoxide and phosphorus vapor produced by the fushion process are extracted from the interior of the furnace. Tap holes are located near the bottom of the furnace from which are withdrawn the slag products of the reaction, mostly calcium silicate and ferrophosphorus.

Two means of collecting the desired phosphorus products are practiced. One is to obtain the elemental phosphorus as the final furnace products by first passing the gases and vapors through electrostatic dust precipitators, and then conden-

FOR DEPENDABLE HEAVY-DUTY SHIPPING SACKS...

there is no substitute for kraft!

Kraft, manufactured from wood fibers, is the strongest paper known to industry. It was introduced in this country in 1909, just about the time when the first generation of Gilmans started manufacturing bags.

As pioneers, we have spanned the years with practical knowledge, technical skills, packaging experience . . . and our modern, completely integrated facilities are a notable example of kraft paper production and conversion.

Now in our 3rd generation of specialization, we are expert in pulp and paper making, in bag manufacturing, in bag printing, in bag designing.

Dependable as a Source . . .
Dependable as a Service

KRAFT BAG CORPORATION

GILMAN PAPER COMPANY SUBSIDIARY
630 Fifth Avenue, New York 20, N.Y.
Daily News Bldg., Chicago 6, Ill.
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MADE-TO-ORDER MULTIWALL SHIPPING SACKS
2 TO 6 PLY—PRINTED OR PLAIN

- Sewn Valve
- Sewn Open Mouth
- Pasted Valve
- Pasted Open Mouth
- Flat Sewn Valve
- Flat Sewn Open Mouth

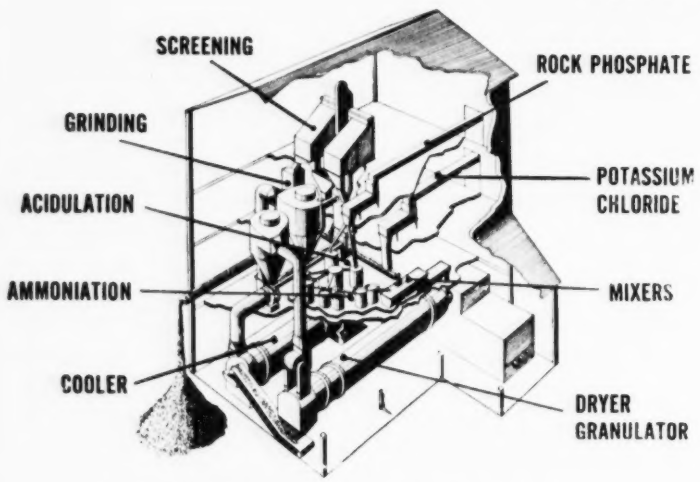
Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gummed Tape Div.
• The Celluseal Corp.
• Kraft Bag Corp.

If your product fits into a bag—we'll make the bag to fit your product

VII advantages

of the ST-GOBAIN Process for the Manufacture of Complete Nitrophosphate Fertilizers

1. The St-Gobain process manufactures granulated fertilizers in one continuous automatic operation. The same equipment can be used to produce various N-P_2O_5-K_2O formulae.
2. Can produce end product in any sized granules desired.
3. St-Gobain plants are available in capacities of 30,000 tons of produced nitro-phosphates per year and up.
4. You benefit from improvements and experience of many years of successful operation on a large industrial scale.
5. St-Gobain process, with the same equipment, permits the use of either sulphuric or phosphoric acid according to the formula of the required fertilizer.
6. Capital investment is low due to the use of simple equipment.
7. Operating costs are low due to a continuous automatic operation and high yields.



Examples of Formulae Produced by St-Gobain Process

N%	P_2O_5%	K_2O%	
10	10	17	(sulfo-nitric acidulation)
11	11	11	" " "
10	15	20	(phospho-nitric acidulation)
12	15	18	" " "
12	12	20	" " "
14	14	14	" " "
10	20	20	" " "

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GENERAL INDUSTRIAL DEVELOPMENT CORP.

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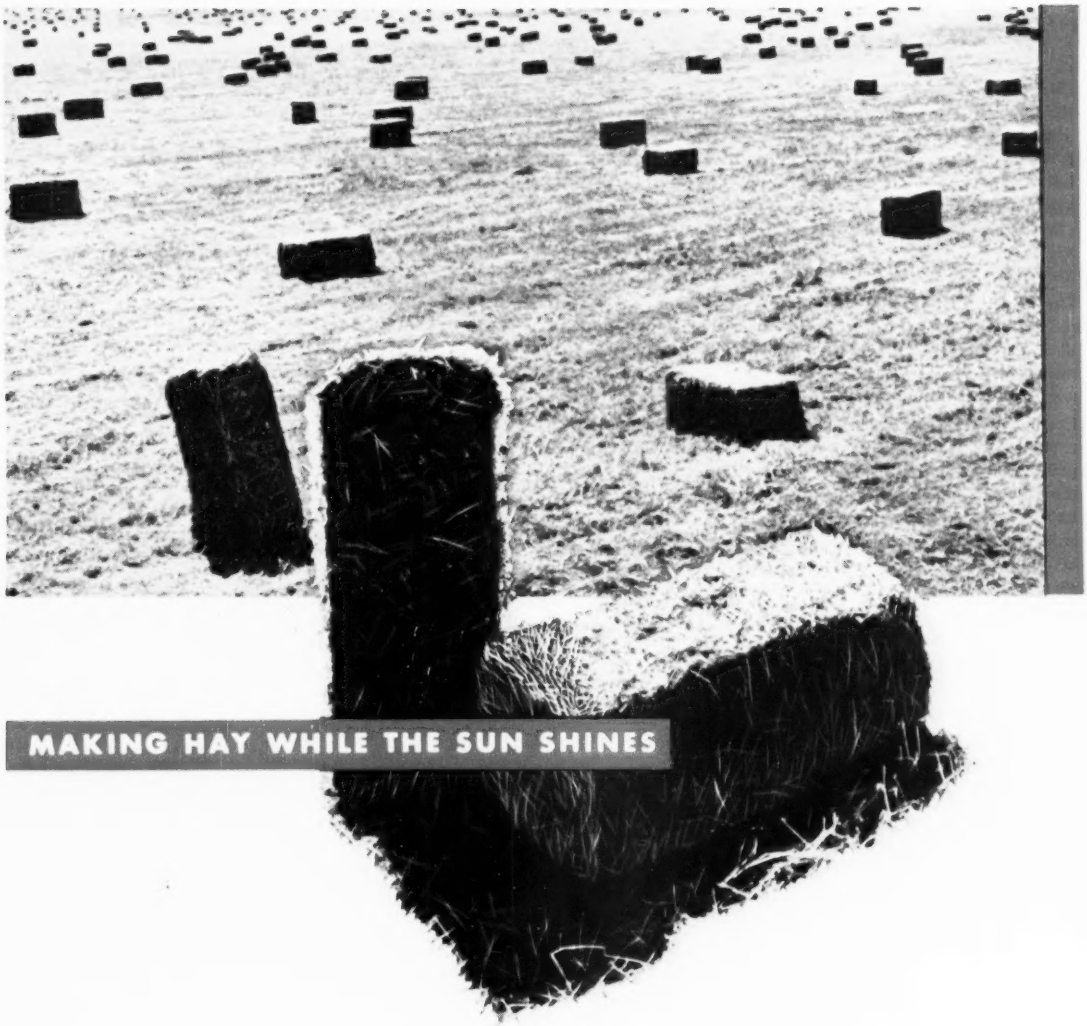
AGENTS FOR ST-GOBAIN PROCESS



MAKING HAY WHILE THE SUN SHINES

Summer after summer this field yields a rich, heavy harvest. Feed that builds healthy, hefty livestock in the winter months. Peak production in the hayfield always puts better meat on the dinner table and bigger profits in the bank.

Healthy harvests come from the soil, ultimate source of all animal and vegetable growth. Yearly, vital plant-food elements drained from the soil are restored by fertilizers.

Many of the most effective fertilizers contain POTASH, often Sunshine State Potash from New Mexico. Potash helps nourish the soil, strengthen crop resistance to disease and drought and proves valuable in producing good crops for better business.

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sing the phosphorus vapor to liquid and storing it under water. This method has the merit of providing elemental phosphorus in the most concentrated form obtainable. As such it can be shipped with a minimum freight charge to the locations where it is converted into phosphorus compounds. This method has the advantage of supplying a highly pure acid. Also the monoxide is saved for use as fuel.

The second method is to burn the furnace gaseous products in an excess of air thus making phosphorus pentoxide, which is combined with water to make phosphoric acid.

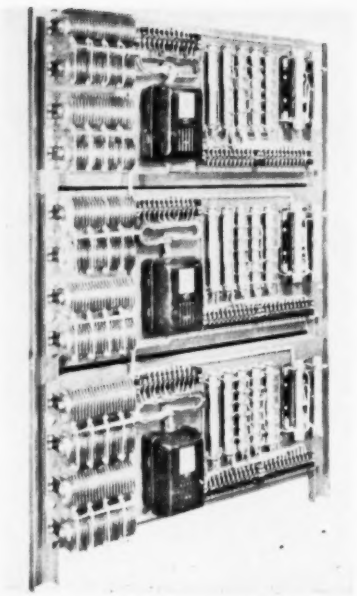
The slag, tapped at intervals from the furnace, is run off into pits in which the heavier ferro-phosphorus settles to the bottom and is withdrawn leaving a slag containing a very high content of calcium silicate. This is crushed for use as a road-bed material. The ferro-phosphorus is broken into sizes suitable for handling and is used to some extent in the manufacture of steel.

Energy requirements for the production of elemental phosphorus as far as energy input to the electric furnace is concerned, approximates 12,000 kilowatt-hours per ton. The electrical load is characterized as steady, of high power factor and of very high load factor. Current surges are slight and abrupt load changes are few by comparison with a steel-melting, direct arc furnace.

Electrical Equipment

The electrical equipment applied to elemental phosphorus furnaces does not differ too greatly in form from that used with steel—and metal-melting direct arc furnaces. This includes high-voltage switchgear, a furnace transformer or transformers depending on whether the supplying bank is made up of one three-phase transformer or three single-phase transformers, and electrode positioning control equipment plus auxiliary motors and controls.

In a submerged-arc furnace the electrodes are surrounded by and in contact with the charge material. Hence operation is considerably steadier than in a direct-arc metal-melting furnace in which the arc plays from the end of the graphite



Rear view of three-phase Rototrol furnace regulator panel installed in the control vault of an elemental phosphorus furnace plant. The regulating motor-generator sets are arranged vertically in a three-high supporting frame-work in order to conserve floor space. For each set, all regulator, amplifying generator and motor leads are brought to a common plug-type connector for ease of maintenance.

electrod to the surface of the metal charge. There is no definite agreement as to the physical nature of the reaction within the charge material of a submerged-arc furnace. Some operators contend there is definitely an enclosed arc at the base of the electrode whereas others believe there is no definite single arc, but that the current path is made up of the particles of the charge with small minute arcs between them. Tests made to determine this have thus far been inconclusive. In any event, the submerged arc furnace does not exhibit the violent characteristics common to the direct arc furnace. When loading charge into the furnace and tapping slag from the bottom cause some shifting of the material surrounding the electrodes, a change in the power level results. It is then necessary to reposition the electrodes to keep current and power level at the desired values. Also as electrodes erode, repositioning is necessary.

Furnace Transformers

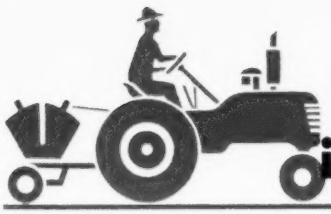
Transformers applied for supplying power to elemental phosphorus furnaces range in ratings from about 3500 kva up to approximately 30,000 kva. At present, the general trend is toward the higher ratings. In some instances three single-phase transformers connected to form a three-phase bank are used. However, the reliability for three-phase furnace transformers is well established. The initial cost of a three-phase unit is much less than a bank of three. As a consequence the trend is definitely toward three-phase units.

Voltages used in the production of elemental phosphorus have increased considerably. Until about five years ago voltages were in the neighborhood of 220 to 280 volts electrode-to-electrode. Voltages of modern installations are about 400. This results from the desire to keep the current—and particularly the size of current-carrying copper—within reasonable limits.

Transformers applied by Westinghouse are of the form-fit, shell-form construction. This construction lends itself well to transformers operating at high secondary currents, i.e. 40,000 to 50,000 amperes. Shellform construction offers means of most effectively handing the lrage stresses encountered, and in conveying the heavy currents in parallel paths of equal impedance. The high-voltage coils are wound with one turn per layer of paper-insulated copper conductors. This offers the minimum voltage stress between layers. Also because the thickness of the coil is the width of one turn, each conductor is exposed to the cooling medium. The low-voltage coils are formed of copper bar and the leads are completely interlaced in order to minimize reactance. The core is made of highgrade annealed laminated sheet steel with alternate lamination joints staggered for low exciting current.

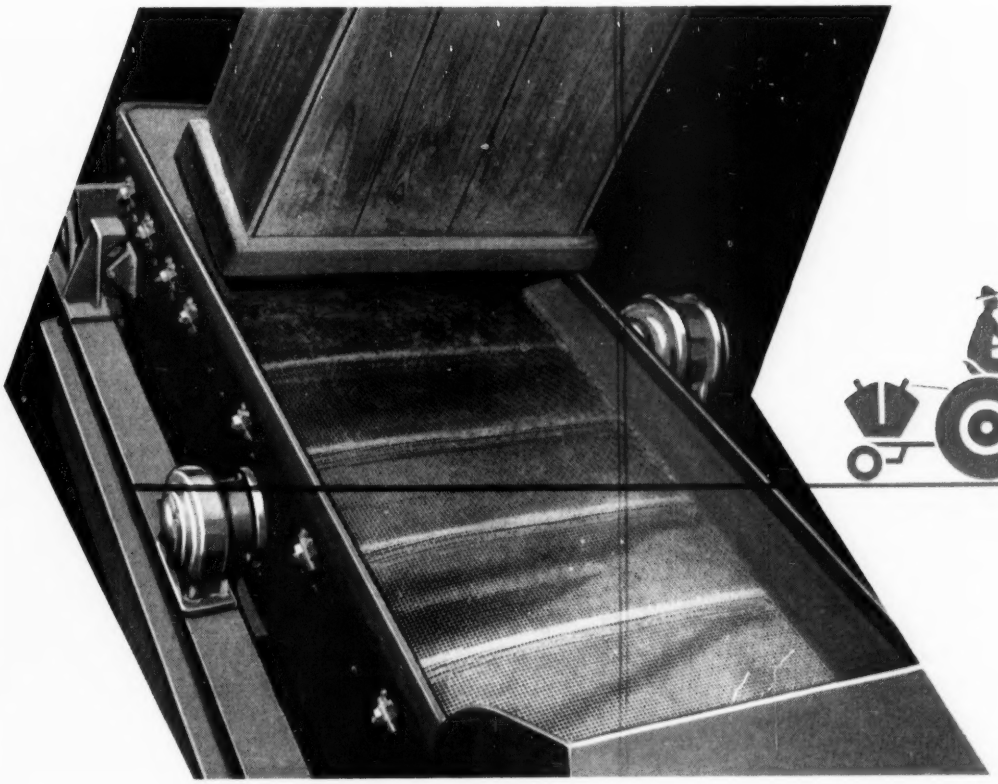
The primary windings of the furnace transformer are provided with taps for adjustment of the secondary voltage applied to the furnace electrodes. However, once the furnace is operating at the required power in-

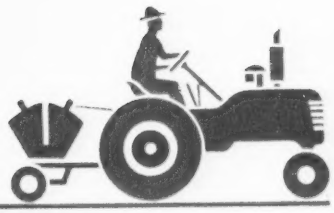
(Continued on page 78)



two SIMPLICITY gyrating screens team up to speed basing operations in fertilizer production

Two Simplicity Gyrating Screens keep operations humming at this large Southern fertilizer plant. Working as a team, they handle the output of two 14" x 7" bucket elevators. A 3' x 8' Model "LS" Simplicity Single Deck Screen handles as much as 50 tons of super phosphate per hour; and a 3' x 6' Model "C" Simplicity Single Deck Screen handles all other fertilizer ingredients at about the same rate of speed. Both screens are set at 20° and rotate with the flow of materials. There is virtually no blinding, as the screen in the photo, which has not been brushed or cleaned, shows. The splendid performance of this Simplicity team is typical of the fine job Simplicity Screens are doing throughout the fertilizer industry. They can help speed up operations and increase production in your plant, too. Write us today for complete information.





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- Sales representatives in all parts of the U. S. A.
- FOR CANADA: Canadian Bridge Engineering Co., Ltd., Walkerville, Ontario
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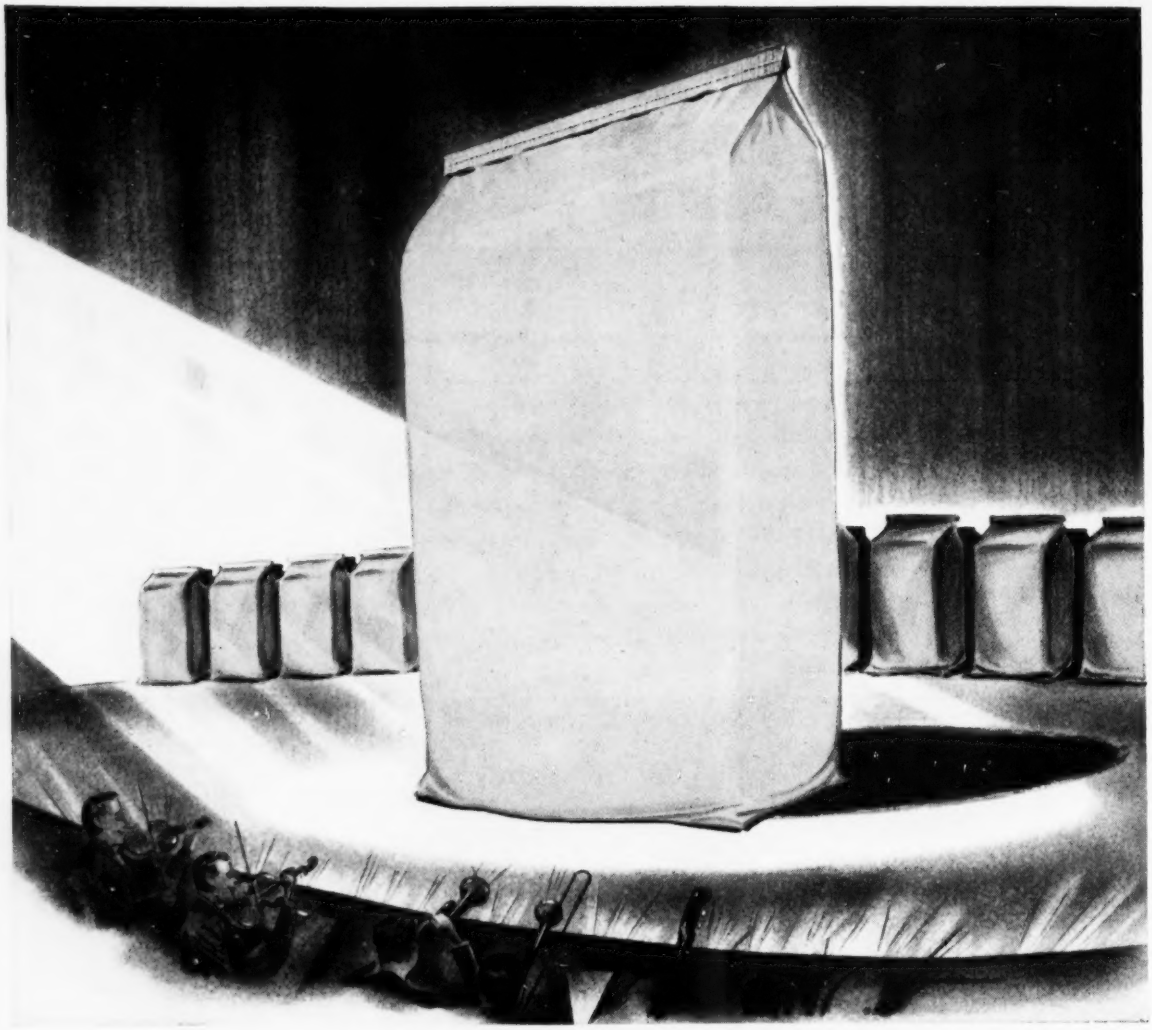

PUT *Your* PRODUCT OUT FRONT

V-C Multiwall Bags not only stand up under rough, tough treatment, they also help you sell. Well-designed, expertly printed bags create the kind of impression that builds customer confidence and good-will for your products and company. They help put your product out front.

Ask V-C, manufacturer of quality bags since 1898, to help you improve and modernize your trade design on your multiwalls. Find out about V-C's expert printing. Learn how V-C's top-quality materials and careful construction mean multiwall bags of greater strength and durability at surprising economy.

V-C Multiwall Bags are available in the following styles: sewn open mouth, sewn valve, sewn valve with sleeve or with tuck-in sleeve.

Discuss your bag requirements with a V-C representative.

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YOU DON'T NEED TO CONTROL YOUR TEMPER when you rely on Aquafil for product control. Aquafil makes it possible for you to market a better mixed fertilizer that is uniform . . . bag by bag. With Aquafil you no longer need to worry about "bag-setting" and costly reprocessing. Find out today about this new stabilizer for all mixed fertilizers that builds bigger profits for you.

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One hundred pounds of Aquafil will do the same job as 400 pounds of old fashioned conditioners.

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Please send me, at once your new folder telling how I can up profits in my mixed fertilizer operations.

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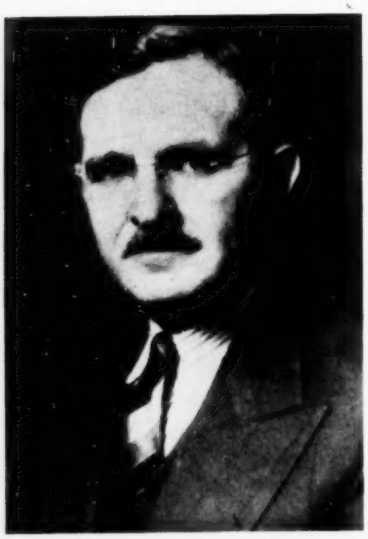
NOBLE TO RETIRE

Weller Noble, known throughout the industry for his constructive activity for the good of the order, has decided to retire from Pacific Guano Company, Berkeley, California, of which he has long been president, and which he has served for 45 years. He will retire April 1. H. G. Hewitt, vice president of the parent company, Pacific Chemical and Fertilizer Company, Honolulu, will succeed him.



W. G. Hewitt, who succeeds Weller Noble as president and general manager of Pacific Guano Company, Berkeley, California. Mr. Hewitt has been vice-president of the parent company, Pacific Chemical and Fertilizer, Honolulu, which position he will continue to hold.

Clarence E. Elsas, president of **Fulton Bag & Cotton Mills** in Atlanta, was elected national president of the Textile Bag Manufacturers Association at the quarterly meeting held recently in Houston. **Richard K. Peek** of the **Percy Kent Bag Company** in Kansas City and Buffalo was elected vice-president.

Elected to the Executive Committee of the Association were retiring president **Lawrence C. Sprosty** of the **General Bag Corporation,** Cleveland, Ohio, and **S. L. Marbury** of the **Wertheimer Bag Company,** Wilmington, North Carolina.

* * *

E. W. Hansen has been made sales manager of **J. R. Simplot Company** fertilizer, fluorspar and barite divisions, with offices at 212 Continental Bank Building, Boise, Idaho, Phone 3-7545; **L. M. Buhler** has been made manager of fertilizer production and phosphate mining, with headquarters at Pocatello, Idaho—P. O. Box 912; Phone 3392.

* * *

Edward W. Harvey, director of sales, and **Dr. George L. Frear,** physical chemist, both of **Nitrogen Division,** are co-authors of a chapter on ammonium phosphates and ammonium superphosphates, chapter 17 in Waggaman's new second edition, "Phosphoric Acids, Phosphates and Phosphatic Fertilizers"—a standard work on the subject and an American Chemical Society monograph.

* * *

R. Erin McAllister has become assitant manager of the **Consolidated Mining & Smelting** chemical and fertilizer sales division at Montreal. **Kenneth T. Seaborne** succeeds him as Western manager at Vancouver. **A. Olaf Wolff** who held the Montreal post is now administrative assistant at the head office in Montreal.

* * *

G. A. Tamblyn is sales manager of **The Frank G. Hough Co.** He has been with the company for ten years.

* * *

S. C. Moody, American Cyanamid and **John R. Riley, Spencer Chemical,** are members of the Chemical Industry Advisory Committee of the NPA which met recently to set up post-attack planning programs for the industry, in case of enemy attack.

* *

John P. Bryan has been named **Naco** sales manager for South Carolina. He has been with them for six years as a salesman.

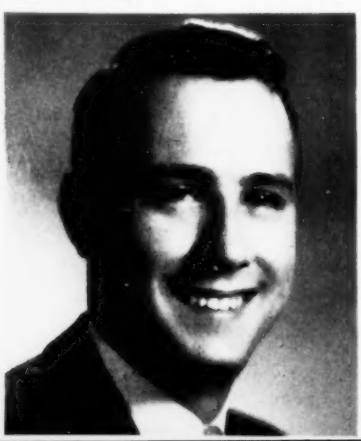
* * *

William J. F. Francis has been made Western general sales manager for **American Potash & Chemical,** succeeding **David B. Scott,** retired after 18 years of service in that post. Mr. Francis has been with **Pennsalt** and **California Spray Chemical.**

* * *

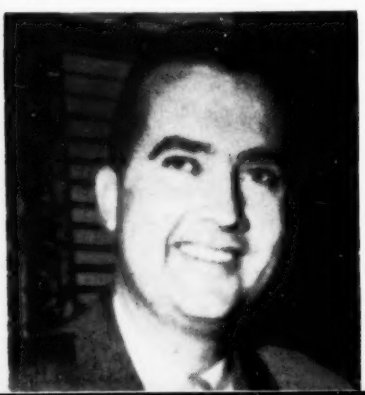
John W. Ground, vice president of Thurston Chemical Company of Joplin, Missouri has announced the following apponitments:

O. M. Walstad plant manager of the Atlas, Missouri plant, responsible for the management of all existing sections at the Atlas plant, including the newly created chemical section. He formerly served as produc-



Richard G. Powell, a Spencer Chemical technical service representative who has been transferred to their North-Central office in Chicago.

Roy T. Fuller has joined Spencer Chemical as Alabama sales representative. He has a long background in agricultural work.



tion superintendent for all company plants.

James A. Doyle will serve as superintendent of the chemical section at the Atlas plant. Doyle is a chemical engineer, having graduated from the University of Arkansas in 1948. He was formerly with **Mathieson Chemical Company.**

Bert W. Crow will assume the duties of assistant superintendent for the chemical section at the Atlas plant. He was formerly with the **Standard Oil Company.**

* * *

Fred C. Broadway has left the **F. S. Royster Guano Co.** and is now with the **Standard Chemical Co.** in Troy, Ala. **John P. Porter** was transferred from the Baltimore division of Royster to succeed Mr. Broadway as Manager on December 1st.

* * *

E. L. Anthony, dean of the School of Agriculture at **Michigan State College,** will close 41 years of agricultural colleg teaching and administrative work next July 1. Announcement has been made that, effective that date, he will go on a one-year retirement furlough, with his retirement to become active a year later.

* * *

F. V. Deaderick has been elected to membership on the board of **Bemis Bro. Bag Co.** Mr. Deaderick is also vice-president and the director of eastern operations for the Bemis company.

The board also named **R. Ramsay** secretary and comptroller. He was formerly secretary and assistant treasurer. **David M. Finley,** formerly assistant secretary, was named assistant secretary and assistant comptroller.

William Bellano was appointed chief project engineer in charge of mining. **James L. Taylor** has been made chief project engineer in charge of construction and **Robert F. Marek** has been made chief project engineer in charge of industrial engineering for the corporation's engineering division, according to an announcement made by **Thomas M. Ware,** vice president, Engineering.

Mr. Ware explained that the appointments were part of a general expansion and reorganization of International's Engineering Division in order to better meet the increased demands of the company's diversification program.

* * *

Harold W. Comfort, executive vice president of the **Borden Company** has been elected to the board of directors of **Commercial Solvents Corporation,** it has been announced by J. Albert Woods, President.

* * *

Percy J. Ebbott, President of the Chase National Bank, was elected a Director of the **International Paper Company,** it was announced by John H. Hinman, President. His election fills the vacancy caused by the resignation, effective January 19, 1953, of **Winthrop W. Aldrich,** former Chairman of the Chase National Bank and now U. S. Ambassador designate to Great Britain.

* * *

Dirck Reichard has been appointed administrative assistant to **John H. Kennedy,** assistant sales manager in charge of agricultural sales for **Stauffer Chemical Company** in the East. In his newly created position, Mr. Reichard will divide his time between the New York office of Stauffer Chemical Company and

Robert N. Conners, left, now executive vice-president; William N. Brock, now general sales manager of Chase Bag Company; both have been with Chase for many years.

Fred G. Barnett, who has become assistant manager of Dallas operations for Fulton Bag & Cotton Mills. He is a great-grandson of Jacob Elsas, the founder, and has been with them since 1939. He is a director of the company.

B. J. O'Hearn, left, occupies the newly created post of Southwestern district manager. E. T. Nelson has become Western district manager, both for Union Bag & Paper multi-wall bag sales.

The newest, best multiwall bags for valve-packing your fertilizer . . .

Bemis B-FLEX Valve Bags!

You should switch to Bemis B-FLEX promptly because . . .

1. LOWER BAG COSTS. You'll save up to $4 per thousand compared with conventional inner-sleeve valve bags.

2. LOWER PRODUCTION COSTS. Faster handling on your packing machines.

3. FASTER PACKING. Are jam-ups a problem? Not with Bemis B-FLEX. No flapping inner-sleeve to slow down material flow.

4. UNIFORM WEIGHTS. You can hit your weights "right on the button." Stop over-packing.

5. CLEAN PACKAGE. Minimum sifting.

6. BETTER CUSTOMER SATISFACTION. No loose, torn sleeves to get into the farmer's drill.

And, of course, you get the added benefit of Bemis' crisp, bright, multi-color printing — the finest printing your brand can have on multiwall bags.

Ask your Bemis Man for the complete B-FLEX story.

Bemis

BEMIS BRO. BAG COMPANY

General Offices
St. Louis 2, Mo.
Sales Offices in
Principal Cities

field work in which he will be in close contact with the various Stauffer regional distributors and agricultural salesmen.

* * *

At the annual meeting of **The Smith Agricultural Chemical Company,** held on Monday, January 19, all nine directors were re-elected, which consists of **Nelson T. White, Clement S. Schmelzer, Carl E. Veth, Stanton G. Prentiss, F. Herbert Hoffman, Jr., Marshall A. Smith, Lowry Sweney, Frank R. Schwartz, Jr.,** and **John E. Powell.** In addition, all officers were re-elected: Mr. Powell, president, Mr. White, first vice president and general sales manager, **Elmer C. Barsch,** vice president and division manager of Saginaw, Michigan, division, **Dick Miles,** vice president and division manager of Holland, Michigan division, **Marshall A. Smith,** vice president and sales manager of Columbus, Ohio division, **Clement S. Schmelzer,** treasurer, **Carl E. Veth,** secretary, **Joseph W. Sheeran,** assistant treasurer and auditor, and **Frank H. Nicklaus,** assistant secretary.

William F. Farley was named vice president and division manager of the Indianapolis, Indiana division.

T. I. Waggoner who has been plant superintendent of the Indianapolis, Indiana plant for many years retired from active service. **Glenn Weber,** who has been acting as an assistant to Mr. Waggoner for a number of years, was moved up and placed in charge of the Indianapolis plant.

At the Saginaw, Michigan plant, **Lawrence Powell,** who has been in charge of Plant operations at this point since 1934 retired from active service, his place being taken by **Virgil Sanford.**

* * *

J. Franklin McLaurin, president of the National Ginners Association, has joined the insecticide division of **Geigy Co., Inc.** The company announces that Mr. McLaurin will maintain a liaison capacity on a nationwide basis with other personnel concerned in the sale of cotton and tobacco formulations.

G. A. Tamblyn who has been promoted to sales manager, The Frank G. Hough Company. He has been assistant since 1948 and with the Payloader people 11 years.

William W. Charwick, who has been made New York district sales manager for the Potash division of International Minerals & Chemical, whom he joined in 1942.

He is chairman of the South Carolina State Unit of the National Cotton Council, past president of the Carolinas Ginners Association for two terms, director of the Marlborough County Farm Bureau as well as president of the National Ginners Association.

* * *

Max J. Danziger has joined **The J. M. Baird Company,** New York, as manager of the agricultural chemicals and fertilizer division. Mr. Danziger was formerly associated with **The Mercantile Metal and Ore Corporation.**

* * *

Three new appointments in the sales department of **American Potash & Chemical Corporation** were announced by **Wm. J. F. Francis,** general sales manager, Western.

Harold J. Bensinger was named sales manager, heavy chemicals department, Western; **Albert F. Swain** was appointed sales manager agricultural chemicals department, Western; and **George A. Schnier** becomes sales manager, refrigerants department, Western.

Nitrogen Division, Allied Chemical & Dye Corporation, March 2, announced the appointment of John D. Waugh as director of information for the Division.

B. F. "Chip" Backlund has been elected vice-president for sales of Lincoln Service & Supply, Inc., Grand Island, Nebraska. He joined them in 1949 and was appointed sales manager in 1951.

* * *

Paul H. Von Wyl, a native of Denver and a chemistry graduate of the University of Colorado, has joined **Pioneer Chemical Associates** and will make his headquarters at the firm's executive offices in Denver.

Southern Section ASA Elects Industry Man

For the first time in the history of the Southern Section of the American Society of Agronomy, an industry representative has been elected to office. At the recent meeting in New Orleans Dr. J. Fielding Reed, American Potash Institute, Atlanta, Georgia was made secretary. The president is R. C. Potts, Texas AES; vice-president and chairman of soils, Eric Winters, TVA; chairman of crops Fred H. Hull, Florida AES. It is customary for the Section to elect only one officer each year, moving them up progressively to the presidency.

Again the Lowlands Fight the Sea

NOT WAR, THIS TIME, BUT NATURE

In June, 1947 we published the article below, because Holland had just emerged from the floods loosed on them by the German Army. Today, with a much greater area flooded, the lowlands of Europe are faced with the same problem. Last time they recovered in 3 years, instead of the predicted 9. With that experience, they can hope to do it again, soon. The article was written in 1947 by H. J. Van Kretschman, at our suggestion.

When the Germans took their anti-invasion measures in the Netherlands, they carried out large-scale inundations of lowlying areas with either fresh or salt water. Large areas of the country are on or below river or sealevel. By destroying dikes, locks and culverts or by opening the locks during high tide and by closing them during low tide it is easy to inundate such areas.

Immediately after the liberation measures were taken to reclaim these flooded parts of the country. The very first thing to do was to repair the dikes and pumping stations. With the few implements, such as dredges, tugs, draglines, trucks, etc., which were left behind by the Germans, it has taken many months to repair all the damage. Manpower was another problem. Laborers had suffered from famine, the effect of which was still felt after the liberation. Besides, there were no houses for the laborers in the flooded areas. Small tools, timber, rubber boots were among the many needed but scarce materials. All these difficulties had to be solved.

An estimate of the real damage could only be made after the dikes and pumping stations had been repaired and the water pumped out. The damage in the different areas was not always the same and depended on the various circumstances or concurrence of circumstances.

The length of time of inundation had a great influence on the vegetation. In areas, which during the winter before the liberation, were flooded with fresh water and which were reclaimed a few weeks after Germany's surrender in May 1945, trees and grasses were still alive, but crops were lost. In areas, which had been flooded during one or more summers, all vegetation had died.

The depth of the water on the inundated parts was of great influence on buildings, farms and houses. The 50,000 acre Wieringermeerpolder, the first completed part of the Zuyderzee reclamation plan, was flooded with fresh water only eight days before the Netherlands were liberated. All the villages and brick farms were destroyed by the force of the waves of the 2-15 feet deep water. During the summer and fall of 1945 this "polder" was reclaimed for the second time, but it was too late for the vegetation which was found dead. During the first few months that this area had been flooded, all the trees were still in foliage and rape-seed flowered normally as long as the water did not rise above two feet. Not one plant survived the summer, however. Roads were still in good condition. Ditches and canals were found partly filled with silt removed from arable land by movement of the water, under the influence of the wind. For a good drainage this silt had to be removed as quickly as possible. The tile drainage was still in good condition.

The effect of the current during the inundation had made itself felt on the reclaimed land. The tide made large quantities of water go in and out twice a day. On the island of Walcheren in the province of Zeeland, which has an acreage of about 45,000 acres, dikes were blown up by allied bombers in 4 places, through which 14,000 million gallons of seawater passed every high and low tide. Ditches were filled by silt and sand; in several places the roads were covered by the same material. Some farmers found their fertile clay soils partly covered by a layer of poor dune-sand. Wide and deep creeks were formed by the in- and out-going streams of seawater. Mussels covered fields, trees and houses.

The influence of the inundation on the chemical composition of the soil was dependent on the kind of soil and the origin of the flood-water, the condition of the soil before flooding and the length of time of the inundation.

Inundation of areas flooded by fresh water and of sandy soils flooded by salt water had no ill effect on the chemical composition of the soil. Immediately after reclamation and reconditioning of the drainage system, such areas could again be used for farming. In areas that were inundated for a short time and which were flooded after a rainy period, so that the soil was saturated with rainwater, the salt water could not enter into the soil;

HOLLAND CONTACTS

Those wishing to get in touch with firms in Holland are offered the services of the Commercial Intelligence Office, Oudebrugsteeg 16, Amsterdam-C, who publish free bulletins in which Dutch firms are listed who seek foreign trade connections.

only a small amount of salt could penetrate into it by diffusion. When flooding took place after a rather dry period, however, the seawater could pentrate freely into the less saturated soils.

The salt content of the floodwater depended on the origin of the water. Some areas were flooded by pure seawater, others by a mixture of sea and fresh water in varying proportions.

The salt had a very bad effect on the structure of the soil and the more salt was left in the soil after reclamation, the greater the damage. The soil is affected by Na-ions of NaCL; the chlorine does not cause much trouble. If the drainage is in good condition, it does not take more than one winter, the season in which the rainfall is in excess of the evaporation, for the chloride to be washed out by rainfall mainly as NaCL but also as CaC12. The Na-ions, however, join with the clay particles, forming a structure-less suspension of sodium-clay which is hard in a dry season and soft and impervious during a wet season. It stands to reason that the original lime-content of the soil before flooding has a great influence on the drainage caused by the Na-ions. The areas flooded by seawater, however, were all reclaimed from the sea three or more centuries ago, in which the lime content decreased considerably. So the floods caused a great deal of damage to the soil.

The only remedies to improve such soils are rest, lime and vegetation. Tilling the soil, especially when it is wet, deteriorated the already poor structure, giving the sodium-clay suspension the opportunity to be washed down to lower layers. Here the suspension contacts a soil, richer on lime, and calcium clay is formed. The calcium clay particles precipitate, clog the capillaries and an impermiable layer is the result.

To replace the Na-ions in the suspended clay, lime is used in the form of easily soluble gypsum (CaSO4). The experience has taught that application of 1-3 tons of this chemical, supplied in several applications over a longer period gives the best results.

Every vegetation, either of crops or weeds improves the structure of the soil. It promotes evaporation and improves the permeability. Careful tilling of a layer of 1 or 2 inches during a dry season may make a seed-bed for crops such as red clover, alfalfa, barley or other CI-resistant plants. The first yield will be very low, but each following crop will give better results. It is expected that 5 to 8 years after reclamation the soil is in its old condition again.

The tile drainage suffered in many areas which were flooded by salt water. In many cases suspended sodium clay particles have partly filled the tiles or clogged the seams between the tilepipes, thereby obstructing the excess of water to enter the tiles. Replacement of drains is the only remedy to repair this damage.

Each farmer has to recondition his own soil; he receives support and advice from the Government. Among other things, gypsum is made available by the government, but farmers who do not strictly follow the advice of the Government are excluded from any further support.

In spite of all the difficulties the last dike was repaired on February 6th, 1946, exactly nine months after the liberation. All the areas flooded by fresh water yielded normal crops and many pastures were resown in 1946 notwithstanding shortage of farm machinery and equipment, farm-power and houses for farmers or farmhands. Much work has still to be done in the field of improving the "salt" areas, reconstructing of farm buildings and supplying of farm machinery to the flooded areas and in places where buildings and equipment have been destroyed on account of war action. Although the Dutch had experience of fighting the sea during many centuries, it will take many years before recovery is achieved, due to shortage of the most important materials.

Random NOTES & QUOTES

We can't resist starting off with the little story, coming to us from many sources, about one Mrs. Black, in Texas, who bought a sack of fertilizer and put it in the garage. Her husband bought a sack of cement, and put that in the garage. Mrs. B. sprinkled a sack over her garden . . . had a lovely driveway, of course.

* * *

We should really have opened with a quote about what Dr. W. E. Colwell, North Carolina State, said about "Don't blame high costs on fertilizer." It is only 57% higher than 1910-1914 prices, and cutting down on its use is a "mistaken economy move." No wonder he heads the Department of Agronomy there.

* * *

Or perhaps top billing should be given to the wealth of things we've seen lately about research:

★ The National Bureau of Standards has completed a corrosion study which proves that galvanized steel is more resistant to corrosion than bare steel. Is this news?

★ USDA's Agricultural Research Administration is now publishing a monthly aimed at researchers and the press—to push agricultural research. Its title, strangely enough, is "Agricultural Research."

★ Now that the Entomological Society of America has absorbed the American Association of Economic Entomologists, the new 400-member organization will publish a flock of papers, bulletins and journals.

★ Dr. Moseman, USDA made a speech a while back in which he told the wheat growers how important is research. "We can't wait until crisis comes" he said in effect, speaking of crop and livestock diseases. "The time for meeting these hazards and when we recognize their potential seriousness."

★ Dr. Edward Smith, Geneva AES (NY) says research shows that insects do not develop resistance to oils, as they do and have to some other forms of pesticide.

★ We are especially fascinated with Oregon State, where they are shooting cockroaches with hot DDT, listening to the heartbeats of a tomato (vegetable variety, if you please) with a Geiger counter, sitting in weirdly lighted cubicles and spooning up mashed potatoes. As the result of all this, somehow, two blades of grass are supposed to grow where one grew before. Don't ask us . . . we just report what we read in the papers, ala Will Rogers.

* * *

The age of commercialized atomic energy is just around the corner, if Vernon Mount will forgive us our trespass. Two great teams are toeing the mark, waiting for the US Government to fire the gun that will start them on electric power production via atoms. Dow Chemical and Detroit Edison are on one team. Monsanto and Union Electric of Missouri are on the other. Sparks will doubtless fly.

* * *

The newspapers round and about

(Continued on page 84)

The Economics

OF FERTILIZER USAGE

By W. R. Allstetter
NFA Vice-President

All of the agricultural soothsayers tell us that farmers are heading into a cost-price squeeze. Farmers will, we are told, pay more for what they buy and receive less for what they sell and therefore their profits will shrink. And don't forget a lot of farmers had troubles last year.

Quite a few of the crystal-ball gazers tell us that this means hard times for the fertilizer business. Some say serious hard times. Of course we all know anything that affects the farmer's economic well-being has an effect on what farmers do about fertilizers. If farmers are really hard hit they won't be able to buy fertilizer unless their bankers come to their rescue. If farmers are scared of all the gloomy talk they may be afraid to invest in fertilizers, or at least some of them will be. Historically farmers have cut their fertilizer purchases in time of declining agricultural prices—and fertilizer manufacturers and dealers have gone broke in times of declining agricultural prices.

You and I know that the most damaging thing a farmer can do is to cut his fertilizer usage. By so doing he produces a smaller volume of goods and makes less profit on each unit he does produce. Thus his profits collapse from two directions. I doubt, however, if we have sold this idea and I would suggest that this sales job is the most important task facing us. It is important not only from the standpoint of our business, but also with regard to the welfare of our farmer customers.

You are all familiar with the economics of proper fertilizer usage but I think it might be helpful if we took one example and picked it to pieces. I have here a slide showing what would happen to yields, costs, and profits on a typical good corn field as proper fertilizer application goes up.

While this example was not taken from Pennsylvania, I understand from Dr. Albrecht that it might well be typical of one of the better Pennsylvania soils. This chart presupposes that the farmer follows the recommendations of the college — good seed, close planting, lime where necessary, etc.

There are certain fixed costs involved in planting and harvesting an acre of corn, and they are higher than most people think. These are the costs which must be met regardless of the yield. They are shown here in Column 2 as $45.00. You may be interested in how these break down:

Land Use	$ 8.00
Taxes	2.00
Buildings	3.00
Power, Mach, & Equip	16.00
Seed	2.00
Labor	8.55
Overhead-Other	2.50
Management	2.95
Total Fixed Costs	$45.00

The first column shows the amount spent on the right kind of fertilizer. In the upper row nothing was spent on fertilizer and the total cost of production is $45.00, yield 45 bushels, and figuring corn at $1.50 a bushel, the net profit was $22.50. It cost the farmer $1.00 to produce a bushel of corn on this field.

ILLUSTRATION OF ECONOMIC EFFECTS OF FERTILIZER USAGE IN CORN PRODUCTION

Fertilizer Cost Per Acre	Fixed Cost Per Acre	Total Cost Per Acre	Corn Yield Per Acre	Corn Market Price
$———	$45.00	$45.00	45	$1.50
5.00	45.00	50.00	55	1.50
10.00	45.00	55.00	65	1.50
20.00	45.00	65.00	80	1.50

Gross Return Per Acre	Net Profit Per Acre	Cost of Producing Bushel of Corn	Cost per Bushel for Extra Corn Prod. by Fertilizer
$67.50	$22.50	$1.00	——
82.50	32.50	.91	$.50
97.50	42.50	.85	.50
120.00	55.00	.81	.67

You can see profits steadily mounted as fertilizer application went up. Also the unit cost of production declined. The farmer who put on $22.00 worth of fertilizer produced corn at 81¢ a bushel. And this difference in cost could be critical when prices go off. The high-producing farmer grew more bushels of corn and made more money on every bushel.

Now let's look at the last column. You can see the farmer could produce the first additional 10 bushels at a cost of 50¢, the second 10 at 50¢ and could produce the next 15 more at 67¢ per bushel. This additional production would be the lowest cost production on the field. And it is this low-cost profitable production that the farmer will gain or lose by his decision on how much fertilizer he uses. I rather doubt if this story has been put over to most farmers.

Corn has been used here as an example, but the economics of high yields apply to almost all crops,

*Delivered by W. R. Allstetter, Vice President, The National Fertilizer Association, before the Fertilizer and Lime Salesmen's Conference at Pennsylvania State College, January 27, 1953.

particularly grassland crops. This of course is of great importance to Pennsylvania whose farmers depend in large measure upon the sale of livestock products. The real basis for most profitable livestock farming operations is the production of low cost feeds on the farm. Actually in a system of livestock farming the production cost of these extra crop units would be considerably less than shown here because something like ½ of the nutrients would be returned to the soil in the form of manure. A leading agricultural authority (Troug)* has estimated the production cost of these extra bushels at less than 25¢ a bushel and, incidentally, of extra hay from properly fertilized fields at $2.50 per ton.

Let's look at it another way. If a farmer needs more feed for his livestock than he is now raising, he has three choices: He can buy more feed on the open market; he can acquire more land on which to grow feed; or he can step up his production on the very acres already in cultivation. Which course is the most profitable? The answer is perfectly clear. Unless he is already at maximum economic yields—and very few farmers have reached this pinnacle — the most profitable course is unquestionably to step up his yield on his present acreage. I have Dr. Albrecht as an authority for this statement.

Let's consider corn a little further. Dr. Albrecht tells me some 20 million bushels of corn, as corn, were imported into the state of Pennsylvania last year, at a cost of $1.70 or $1.80 a bushel. This corn, or its equivalent in other feeds, could have been produced in the state on the very land that is now in cultivation, for at least $1.00 a bushel less than its purchase price. To have done this would have meant an increased net income for Pennsylvania farmers of more than $20 million, or an average increase in net income of over $2.00 for every cultivated acre of every farm in the state. Actually I would estimate the total feed imports in the state as quite a bit more than this. Maybe three times as much, and I think I am correct in saying that all of it could have been produced in Pennsylvania on the very land now in production at a fraction of its purchase price.

I doubt if there is anything quite like the economics of fertilizer usage in our whole economy. It is a spectacular story. To the extent we put in over we will sell more fertilizer and help not only ourselves but the Pennsylvania farmer and all those who deal with him directly or indirectly.

Stated another way, the best sales argument for using fertilizer is its dollars and cents return. When fertilizer is used efficiently the economic argument is most spectacular and persuasive. This is where the college people come in. Their job is to find the most efficient ways of using fertilizer and supply farmers and others with the information about its benefits. It would be a

*Emil Troug, Chairman, Department of Soils, University of Wisconsin.

great thing if we had for each of the major crops in Pennsylvania, a single leaflet on the economic benefits of producing high yields, one for corn, one for wheat, one for tobacco, one for grass, etc. Now it seems to me that the agronomy Department at Penn State is doing a great job with its resources, but it can't do all the things that it would like to do and should do, or what we would like to see it do, without adequate resources. It is certainly to our interest to support them in every possible way in their efforts to get the facilities to do the job. As time goes on the fertilizer industry will become more and more dependent upon the activities of the Agronomy Department and we ought to keep this in mind at all times.

We have been talking here about how to create the desire on the part of the farmer to use fertilizers. Let us assume for the moment we can create this desire and see what other obstacles there are. For instance, will his landlord go along? The economic sales argument will, I believe, be even more persuasive to the landlord than the farmer himself because the landlord's interest is primarily an economic one. He is a fellow we want to keep after all the time and a good time for us to concentrate on him is in the off season.

Many of you have seen Lloyd Dumenil's article on "How to Convince a Landlord," published in the January 1953 FARM JOURNAL. We have circulated reprints widely and it might be helpful in your sales work.

Suppose a farmer—either tenant or owner—has the desire and doesn't have the money. That is where the banker comes in. The banker wants to be shown in dollars and cents terms. He has to have it that way because he is dealing with other people's money. Here in Pennsylvania I believe we have a great opportunity to work with bankers. Carl Dellmuth, the very able Executive Secretary of the Pennsylvania Bankers Association, is naturally interested in the subject of raising farmers' income. I understand he is publishing an article by Dr. Albrecht in the current PENNSYLVANIA BANKER, the official publication of the Bankers Association. I am sure you want a copy of this article and that you will want to discuss it with the local bankers in your area. I understand the article stresses the economic side of fertilizer usage and urges soil tests as one means of insuring sound loans to farmers.

You perhaps know that the National Fertilizer Association has been working with bankers for some time now. We are preparing a brochure on fertilizers for banker use and within a few weeks this publication will be distributed to every banker in the United States. It will, I believe, provide you with another opportunity for talking over fertilizers with the local banker.

We are in the process of sending to every banker in Pennsylvania a copy of the most recent issue of our magazine, the NATIONAL FER-

TILIZER REVIEW, and inserting a card by which they can ask to be put on the mailing list to receive future issues.

On occasion I have encountered bankers who in the interest of the wealth of their community have become aggressive advocates of liberal and proper fertilizer usage. Last summer I met two bankers who are actually giving out free samples of fertilizer to their farmer-borrowers with instructions on how to put out tests plots on their own farms. Needless to say, fertilizer usage was booming in their communities.

So much for economics and sales. I hope I have not given the impression that The National Fertilizer Association is advocating fertilizers as the complete solution to all farmers' needs. We all know that a rounded program on the farm is the way to increase wealth. We as fertilizer salesmen will benefit our customers and ourselves by selling a package deal of the essential practices recommended by the college. Fertilizer may be the keystone to profitable farming but it can't do the job alone and we hurt our case when we forget the other necessary farm practices.

In closing I would like to show a few slides on estimated fertilizer supplies in the coming year. This is the measure of the job ahead of us. It is our opportunity for greatly expanded business if we do a good selling job.

As you can see, we are going to have to sell a lot of fertilizer to keep up with supplies. It is a real challenge—and a real opportunity.

	Estimated 1951-1952 Consumption	Estimated 1952-1953 Supplies	USDA Production Goal for 1954-1955
Nitrogen	1,425,000	1,585,000 (up 11%)	2,185,000 (up 38%)
Phosphate	2,235,000	2,465,000 (up 10%)	3,485,000 (up 41%)
Potash	1,585,000	1,850,000 (up 17%)	2,185,000 (up 17%)

Electric Furnace

(Continued from page 62)

put level, a change in electrode voltage is generally unnecessary because the furnace operates continuously. No-load tap changers, usually manually operated, are provided as an integral part of the transformer. Normally, the primary and the secondary windings are connected in delta. All leads of the secondary are brought out of the transformer so that the joint of delta closure can be made as close to the electrodes as possible, and so that interlacing of the bus runs can be accomplished to minimize reactance.

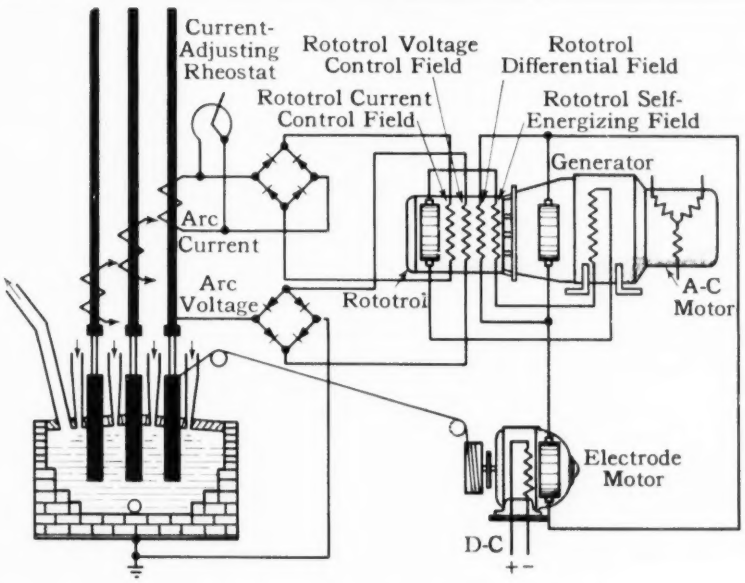
Transformers are most frequently oil insulated and are either water-cooled or forced oil cooled. When forced oil cooling is utilized the oil-to-water heat exchangers are mounted on the side of the transformer tank.

The normal accessories for a furnace transformer include built-in secondary current transformers for giving an indication of the electrode current, a means for sealing the opening in the tank cover where the heavy bus bars are brought through, oil-temperature indicators, oil-level indicator with alarm contacts, thermo-syphon oil conditioner, mechanical pressure-relief device, water-flow indicator, and a dehydrating breather to prevent moisture-laden air from entering transformer.

Switchgear Equipment

Generally, switchgear used on the high voltage side of a phosphorus-furnace transformer does not differ much if at all from the switchgear used in power generation and distribution systems. Because the operation of the furnace is continuous and relatively steady breaked operations are less frequent that occur with steel-melting furnace installations where violent arc-path changes during the meltdown period may cause several operations of the breaker per hour at currents several times normal rating. Also, in steel-melting furnace practice it is necessary to change taps on the transformer several times during the melt. Each tap change requires an operation of the circuit breaker. The circuit breaker in a phosphorus-furnace circuit need not be operated but several times a day and these are mainly at normal or reduced loads to slip or lower the electrodes in their clamps as they erode. Since operation is usually continuous on one tap voltage, a breaker operation for changing the no-load tap-changer setting is not frequent.

Because circuit-breaker duty is not too severe both oil breakers



Simplified circuit diagram for an elemental phosphorus furnace controlled by a balanced-beam regulator.

and air insulated breakers have been used. Depending upon space available, the circuit-breaker equipment can be either of the indoor or outdoor type; and depending, of course, on type may be either frame-mounted or metal enclosed.

The breaker closing and tripping circuits are interlocked with the transformer tap changer such that the breaker must be opened and remain open during tap changes. A reliable means for tripping and closing a breaker is essential. For this reason energy is either from a battery or for tripping purposes and from an a-c source through a rectifier for closing. Under-voltage tripping devices are used to trip the breaker and prevent its operation to the closed position should there be failure of the d-c control power or d-c power for the field of the motor driving the electrode winch.

Electrode Positioning Control Equipment

Shifting of the charge within the furnace during the fusion process, electrode erosion, and the continuous tapping and charging methods used, causes the effective resistance of the circuit for a given initial electrode position to vary. To maintain power input constant the electrodes must be automatically positioned vertically in the charge. To accomplish this, the electrodes are suspended in the charge through the roof of the furnace by a winch mechanism driven by a d-c motor. The

direct-current power can be either constant or adjustable voltage, depending on the type of electrode positioning regulating equipment.

There are two main types of Westinghouse electrode positioning regulators used with elemental phosphorus furnaces. There are the balanced-beam regulator and the Rototrol rotating regulator. The balanced-beam regulator and the Rototrol rotating regulator. The balanced-beam furnace regulator was introduced to the arc furnace industry in 1920. Since then it has been utilized extensively on both direct-arc furnaces and submerged-arc furnaces. This regulator, uses for its intelligence a signal derived from the current flowing in the electrode and a signal derived from the voltage appearing from electrode to ground or the shell of the furnace. When desirable to use current regulation only, a constant voltage can be used instead of the signal of electrode-to-shell voltage. The regulating element itself is composed of a beam pivoted at its center with its movement controlled by solenoids on each side of center. One is a current solenoid into which the signal of electrode current is fed. The other is a voltage solenoid supplied with the signal of voltage. A shunting rheostat is connected in the circuit essentially across the current solenoid so that the electrode current required to effect a balance between the two solenoids can be adjusted. Under balanced conditions as selected by the furnace operator through adjustment of the current adjusting rheostat, the pull of the current solenoid on the beam element and the pull of the voltage coil solenoid on the beam element are equal and the regulating beam assumes a neutral position in which neither of its contacts are closed.

Tipping of the beam on a deviation from desired setting of current in the electrode closes contacts that cause the reversing contactor coils to be energized. Thereby, the winch driving motor armature is connected across the constant-voltage d-c supply with polarity such that the electrode is moved in the right direction to reestablish the desired current.

The d-c source most commonly used is 230 volts, and the electrode motor fields are continuously energized while the furnace is working. The reversing contactors are specially built to function millions of times. They are spring mounted, thus eliminating bearing maintenance problems. In the regulator element itself, the moving beam is spring mounted and dashpot elements are employed to assure positive action.

The balanced-beam regulator is simple in operation and construction and is adequately accessible for maintenance purposes. Experience has proved it to be very satisfactory for controlling elemental phosphorus furnaces.

In contrast to the contactor or balanced beam, the Rototrol regulator is a rotating device. The signals, instead of being sent into solenoids that actuate the beam movement, are applied to control fields of a high-response, direct-current exciter-regulator in such manner that the ampere-turns of the two control

fields counteract each other when the desired balance condition prevails in the furnace.

An indication of electrode current is rectified and passed into one control field of the Rototrol regulator. A rectified signal derived from the voltage between electrode and shell of the furnace is fed into the opposing control field. A rheostat shunted across the electrode current signal circuit provides adjustment for different electrode currents. When balance obtains, the ampere-turns of the current control field equal those of the voltage control field and the output of the Rototrol the control fields become stronger due to the position of the electrode in the furnace not being correct a definite flux is set up in the magnetic field circuit of the rotating regulator and its voltage output would be of some definite magnitude and polarity. The regulator output is fed into the field circuit of an amplifying generator whose output is in turn supplied to the armature circuit of the electrode-positioning winch driving motor. Thus, the voltage impressed across the winch motor causes the electrode to be moved either up or down as required to restore the balanced condition of electrode current and electrode-to-shell voltage so that again the output of the regulator is **again zero.**

As Figure 2 shows the Rototrol regulator has two other fields; a differential field and a self-energizing field. The differential field feeds back a negative signal so as to stabilize the amplifying generator output. The self-energizing field is included in order to amplify the unbalance resulting from the interaction of the two control fields.

The operator's control panels for both the balanced beam type of regulator and the Rototrol regulator are quite similar. This form of equipment permits the operator to control the furnace remotely from the control room provided at the installation and gives complete indication of operating conditions as well as the required control switches for altering the operation as the process may require.

Associations . . .

NFA Banker Book

National Fertilizer Association has published a booklet, "Fertilizers . . . a Cornerstone of the Welfare of the Nation," designed for banker use. (See Alstetter speech in this issue). In order not to conflict with a comparable booklet being mailed by the Ohio State Bankers Association, NFA's mailing will be delayed until August.

CFA Schedules Two Meetings

The First Annual Fertilizer Conference to be sponsored by the Soil Improvement Committee of the California Fertilizer Association, will be held at the Hotel Marysville, Marysville, California, on Thursday and Friday, May 7 and 8. The Conference program will feature technical discussion, and colored slides showing response to various plant food materials, and deficiency symptoms. Technicians from the University, the USDA, the SCS, and from the industry will take part. The Agricultural Extension Service, University of California, is arranging a field trip to fertilizer experiment plots in the area.

The Thirtieth Annual Convention of the California Fertilizer Association will be held at Carmel-By-The-Sea, California, on Monday and Tuesday, November 9 and 10. Monday, November 9, will be devoted to the formal program which will be held at the Golden Bough Theater in Carmel. Tuesday, November 10, will be given over to relaxation and competitive events, featuring men's and women's golf tournaments at the Monterey Peninsula Golf & Country Club. The Annual Banquet will be held at the Monterey Golf & Country Club on Tuesday evening.

GPFES Directors Hold Meeting

At the call of president Joe M. Shepard, V-C Chemical, Atlanta, the directors of the Georgia Plant Food Educational Society met in Macon, Georgia, February 18. One prime result was the election of four vice-presidents, required in the bylaws to be chosen from among the directors. They are: Malcolm A. Rowe, Rowe Warehouse and Fertilizer, Athens, past-president; John L. Sanders, Spencer Chemical, Atlanta; W. E. Harley, Southern Fertilizer and Chemical, Savannah; W. A. Higginbotham, Jr., Armour Fertilizer, Albany.

Letters were received expressing the full cooperation of the University; surprise at the demand for the Fertilizer Recommendations folder reported here last month. Reports were made on the Bermuda Grass demonstrations and the Grazing System Contest. Money was appropriated to buy a print of the NFA corn motion picture for the AES film library. John Sanders, Malcolm Rowe and Charles Belding were appointed to help design a horticultural project to be sponsored by the Society. The Society secured agreement from Georgia Farm Bureau News and the Market Bulletin edited by Georgia's Commissioner of Agriculture, Tom Linder, to publish the fertilizer recommendations. Plans for Summer meetings were launched.

Thompson Starts Own Business

Friar M. Thompson, Jr., vice-president of the Prentiss Drug & Chemical Company, New York, and manager of its insecticide department, has resigned from the company to establish his own consulting business in Athens, Ga. He was associated with Prentiss for eight years, and prior to tha', was engaged for fifteen years in insecticide research, development and sales work for the Hercules Powder Company, Wilmington, Del. In this capacity, Mr. Thompson will specialize in insecticides, rodenticides, herbicides, fungicides, seed disinfectants and in chemicals related to the Southeast grasslands program.

CLASSIFIED ADVERTISING

FOR SALE: HA PAYLOADERS. HYDRAULIC SNUBBED DIPPERS. COMPLETELY OVERHAULED BY EXPERTS THEN PLANT TESTED AND READY FOR THE SEASON. $1400 to $2000 F. O. B. MONTGOMERY, ALA. PHONE H. L. DEWITT.

WANTED Complete equipment for small fertilizer plant. Must be in good condition. Advise equipment available and price. Box #36 c o Commercial Fertilizer, 75 Third St., N. W., Atlanta, Ga.

WANTED: Plant Manager for Dry Mixing Plant located in Ohio. Must be capable in the handling of all plant operations, personnel and equipment. This is an unusually good opportunity for a qualified man to become associated with one of the large fertilizer companies. In reply give full particulars regarding self and salary desired. Box 35, c/o Commercial Fertilizer, 75 Third St., N. W. Atlanta, Ga.

FOR SALE: ROTARY DRYERS FOR GRANULATION. 4-7' x 60' and 3-6' x 60' Rotary Kilns. These make excellent heavy duty long life direct heat Rotary Dryers by installing lifting flights. Other Rotary Dryers in stock: 8' x 54', 6' x 42', 5' x 40', 4'6" x 35', and 4' x 30'. Send us your inquiries for Jaw, Gyratory and Roll Crushers, Ribbon and Drum Mixers, Pulverizers, Bucket Elevators, Hammer Mills, Vibrating Screens, Belt Conveyors. We buy your idle machinery. Our 35th year. CONSOLIDATED PRODUCTS COMPANY, INC., 14 PARK ROW, NEW YORK 38, N. Y.

Position available — Superintendent, Mixed Fertilizer Plant. Deep South, preferably with acidulating experience. Salary in proportion to ability. Box #91, c/o Commercial Fertilizer, 75 Third St. N. W., Atlanta, Ga.

WILL PURCHASE good used equipment for small fertilizer plant. The equipment we want will probably come from some plant finding increased capacity necessary and wanting to change equipment accordingly. If you are in such a position, write to Box #38, c o Commercial Fertilizer, 75 Third St., N. W., Atlanta, Ga.

WANTED—2 48" x 20' shell Glen Falls Sulphur Burners, Condition must be good and price reasonable—subject to inspection. Box #40, Commercial Fertilizer, 75 Third St., NW., Atlanta, Ga.

POSITION AVAILABLE for Plant Superintendent of small dry mixing plant in Southwest. Granulating experience preferred. All replies held in strict confidence. Write reply to Box 39, c o Commercial Fertilizer, 75 Third St., N. W., Atlanta, Ga.

DOWD PRESS, INC., CHARLOTTE, N. C.

Bag Contests In 30 States

Sewing contests encouraging farm women to save money by converting cotton feed, flour, and fertilizer bags into clothing and household articles will be sponsored by 30 state fairs this year, the Textile Bag Manufacturers Association reports.

Cash prizes, sewing equipment, and certificates of achievement will be awarded in the "Save With Cotton Bags" contests, a new feature of an expanded 1953 fair program. Cotton bag manufacturers have entered exhibits in state fairs since 1951, but this is the first year sewing contests have been conducted on any major scale.

Blood-Gift Drive At Hudson Pulp & Paper

We have just learned of the highly successful blood drive staged in the Palatka, Florida, mill of Hudson Pulp & Paper. Staged in mid-December, it was set up as a Christmas gift to the troops. The company gives credit for its success to the organization by Joe Berg, their industrial relations manager, the cooperation of the six unions, and the non-union departments.

Davison-Kennedy Celebrate 65th Year

In a beautifully printed and illustrated folder, Davison-Kennedy Co., Atlanta fertilizer machinery concern, celebrates its 65th year with a message from President A. T. Kennedy, and a listing with pictures of the employees who have been with them five years or more—service totalling 150 years.

Henry Valve Offers Catalog

A catalog which illustrates and details completely their new line of newly designed valves for fertilizer use, and in other corrosive applications, has been issued by Henry Valve Company, 3215 North Avenue, Melrose Park, Illinois, and will be sent on request, without charge.

Safety

(Continued from page 45)

because men can buck and make a program fail.

Fire Prevention by W. F. Zielenske, Marsh & McLannan: Start safety while plant is in blue-print stage. Watch water supply, public fire protection. Watch local exposure regulations, as National Board rules may not apply. Watch inflammables, and construction. Concrete can actually melt and run like water. No make-shift heating devices.

Housekeeping in Fertilizer Plants by E. O. Burroughs, Jr., Royster Guano: Labor costs is high and a good housekeeper is a good worker. Watch trash, heavy objects loose on platforms, elevator heads etc., fire extinguishers handy and filled, pop bottles etc. on floor, bags and barrels of scrap, splintered lumber. These and many other danger points. He used a set of cartoon drawings showing graphically how accidents happen, pointing out that bad accidents go with bad housekeeping. The most dramatic—a picture of the Superintendent's office with bad housekeeping very evident—how can men be expected to do as he says, not as he does?

Before and After by A. C. Thornton, International Minerals and Chemical: Full time safety supervisors at larger installations. Safety committee to educate workers,—both management and worker on committee. Annual safety contest with trophies. Set up program plant by plant, after team survey. Full responsibility placed in each plant. Manual developed. Planning extension of program via job analysis to set up special safety training for each job.

$150,000 Fire Sweeps Fertilizer Plant

A $150,000 fire swept the fertilizer manufacturing plant of the Northwest Co-operative Mills at Green Bay, Wisconsin March 3. No one was injured. Firemen prevented the blaze from spreading to an adjacent building containing 20,000 gallons of nitrogen solution.

Random

(Continued from page 74)

the country are growing lyric about fertilizer with Santomerse added. "Feels like satin and flows like water" is the way a Philadelphia sheet puts it. A long way from the day when the one requirement was that fertilizer should be black as night, and as smelly as very dead fish could make it.

* * *

Things are getting too easy. We read the other day about a hormone to prevent tomatoes the vegetable variety, of course, having seeds, which is being bottled and sold nationally by a couple named Olshansky of Chicago. Now we see a huge, dramatic full page newspaper advertisement of a chemical, developed by U.S. Rubber's Naugatuck Division, which kids grass into thinking it is full grown, when actually it has stopped at good lawn length. Pretty soon we can all stay in bed all day.

* * *

We were interested in a little gadget developed by Davison Chemical. You know these salt shakers with the Magic Blue Crystals, that just pour and pour until the crystals turn pink—then you bake them out and start over? Davison has a bullseye, which can be welded into a container, and which reads blue or pink as the condition of the contents may be. Davison will sell 'em.

* * *

We were intrigued by an illustration sent out by Fashions for Industry. They had a gal who looked poured into a coverall, and nice pouring it was, too, to illustrate the designs by somebody named Tina Leser. The thing protects, but it reveals, too—and we wonder about its effect on innocent male bystanders. These smart, svelte and deliriously feminine things are acid-proof and otherwise protective against industrial hazards. No comment was offered about protection from other hazards which tomatoes (the human variety this time) are subject to.

RURAL REVOLUTION

Since 1900, rural America has undergone an agricultural revolution. Many things have contributed to this change. FERTILIZER, the product of one of this country's great industries, has played a major part.

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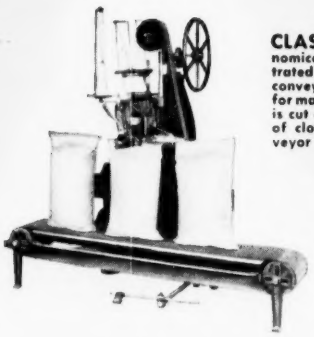
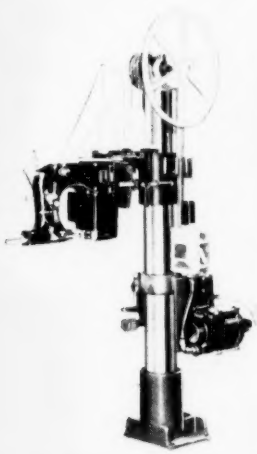
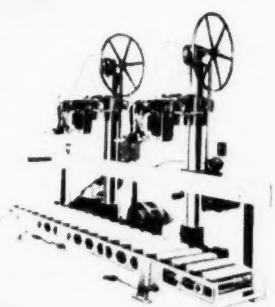


CLASS 21800 *(left)* **for fast, economical closing of paper bags. Illustrated is Style 21800 H with 5 ft. conveyor and 80600 H sewing head for making tape bound closure. Tape is cut off automatically at each end of closure. Sewing head and conveyor adjustable vertically.**

CLASS 20500 *(above)* **machines are heavy duty, high production units for closing medium and heavy weight bags. Available with power-driven horizontal conveyor, inclined conveyor, or both; or with conveyor transmission unit only, for plant production line.**



STYLE 20100 H *(left)*, **is a heavy duty, high production column type machine designed for use with plant conveyor systems. Sewing head is pedal controlled.**



DUPLEX MACHINES *(right)* **are designed for closing double bags. The first sewing head closes the inner bag; the second closes either the outer bag alone, or both bags together for extra safety. Also recommended for single closures where continuous operation is a must — operator can instantly switch to other head.**

Union Special

BAG CLOSING MACHINES